WRAIR'S INVESTIGATOR'S DISPATCH

Celebrating a year of Successes

WRAIR

WRAIR PROTECTS YOUR SIX

Protecting your brain - the most important six inches on the battlefield

CENTER FOR MILITARY PSYCHIATRY AND NEUROSCIENCE

- Blast Induced Neurotrauma and Neuroprotection
- Sleep & Resilience
- Team Performance and Mental Fitness
- Military Psychiatry

Protecting the most important six microns between you and the threat of disease

CENTER FOR INFECTIOUS DISEASE RESEARCH

- Vaccines & Entomology
- Viral & Bacterial Diseases
- Military HIV Research Program
- Experimental Therapeutics & Emerging Infectious Diseases

WHETHER YOU'RE AT HOME STATION OR SIX THOUSAND MILES AWAY

WALTER REED ARMY INSTITUTE OF RESEARCH'S MISSION

Discover, design, and develop solutions for military relevant infectious disease and brain health threats through innovative research protecting and optimizing warfighter lethality.

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PROMOTED HASHTAGS

#WRAIRProtectsYourSix
#DefeatInfections #WorldHealth
#MaximizeHumanPotential
#ForgeTheFuture #SoldierHealth

WALTER REED ARMY INSTITUTE OF RESEARCH IS A SUBORDINATE COMMAND OF MRDC

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LETTER FROM COL DEYDRE TEYHEN,

COMMANDER OF THE WALTER REED ARMY INSTITUTE OF RESEARCH

General Stephen Townsend, former Commanding General of the U.S. Army Training and Doctrine Command, opened his preface to a pamphlet on multi-domain operations by saying, “one of our duties as Army professionals is to think deeply and clearly about the problem of armed conflict in the future so that we can build and prepare our Army to deter that conflict and, if necessary, fight and win it.”

Though future conflicts, spanning multiple domains on land, sea, air, space and cyber, will require significant technical advancements including communications, precision fires and other enabling capabilities, the U.S. Soldier remains the nation’s top weapons system and the most critical component to winning its wars.

Operating since 1893, WRAIR has been on the front line of protecting and enhancing Soldier readiness and lethality, particularly in the areas of brain health and infectious disease. Though WRAIR’s work maintains Soldier health, its products also have important civilian applications, saving countless lives around the world.

To stay on the front line, 2019 was a time of change. WRAIR welcomed researchers from the now-deactivated U.S. Army Center for Environmental Health Researcher and continued its internal reorganization, including operationalizing the new Center for Enabling Capabilities to organize and unite the unique competencies that allow WRAIR to conduct research at the velocity of relevance.

Our research focus also shifted to ensure that WRAIR’s global research network, including the Center for Infectious Disease Research, the Center for Military Psychiatry and Neuroscience and medical research directorates in Africa (U.S. Army Medical Research Directorate-Africa), Southeast Asia (U.S. Army Medical Directorate-Armed Forces Research Institute of Medical Sciences), the Republic of Georgia (U.S. Army Medical Research Directorate-Georgia) and Washington State (U.S. Army Medical Research Directorate-West), meet the needs of the far-forward Soldier operating in the multi-domain environment.

Thank you for joining us as we highlight the accomplishments of WRAIR’s approximately 2,700 Soldiers, civilians and contractors.

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EMERGING INFECTIOUS DISEASE

Emerging infectious disease (EID) can threaten political and economic stability, overwhelm partner capacity, and jeopardize a calibrated force posture, endangering compete phase activities as well as gains consolidation during the re-compete phase of multi-domain operations (MDO). Infectious disease can emerge in dense, urban, and remote environments, threatening operations during the penetrate, dis-integrate, and exploit phases of MDO. WRAIR's historic experience, extensive capabilities, and international research infrastructure allow its scientists to quickly develop countermeasures against EID threats.

FIRST-IN-HUMAN TRIAL FOR MARBURG VACCINE

The WRAIR Clinical Trials Center, in collaboration with scientists at the National Institutes of Health's Vaccine Research Center, finished a critical first-in-human Marburg vaccine Phase 1 clinical trial in 2019. Marburg virus disease is similar to Ebola in its clinical symptoms, potentially with a higher mortality rate--during a 2017 outbreak, 67% of cases resulted in death. As Marburg virus disease outbreaks intermittently affect sub-Saharan Africa, they constitute a severe threat to global health.

This important vaccine's development timeline was accelerated in part due to the 2017 outbreak in a Uganda where five people were infected and three died; ongoing Marburg outbreaks intermittently affect sub-Saharan Africa and threaten global health security. A similar Ebola vaccine developed by the VRC was tested in 2016-2017 and determined to be safe and immunogenic.

USAMRD-A COMPLETES EBOLA CLINICAL TRIALS

U.S. Medical Research Directorate-Africa in Nigeria (USAMRD-A/N) successfully completed the RV 456 clinical trial (Ebola vaccine) with a retention rate of 90% at 12 months. Under RV 456, the USAMRD-A/N mil-mil partnership is the only organization in Nigeria to execute phase II product development in the country. U.S. Medical Research Directorate-Africa in Tanzania conducted joint investigation on the safety and immunogenicity of two prophylactic Ebola vaccine regimens in a Phase II clinical trial. The investigations are now in the data analysis phase and will contribute towards obtaining regulatory clearance for the Ebola vaccines clearance for becoming available to the general public.

EBOLA VACCINE RECIEVES FDA APPROVAL

WRAIR conducted a series of nonclinical and clinical studies on the Ebola virus vaccine Ervebo, approved by the FDA in December, 2019, against the Zaire strain.

FIRST-EVER CLINICAL TRIAL OF A MERS-CoV VACCINE

The Emerging Infectious Diseases Branch, in partnership with industry, successfully completed and published the findings from the first-ever clinical trial of a Middle East respiratory syndrome (MERS-CoV) vaccine candidate and the third-ever trial of a coronavirus vaccine candidate. The findings were published in The Lancet Infectious Diseases in September, 2019. Plans are currently underway to test the product South Korea and at a WRAIR-developed site in the Middle East, locations where large MERS-CoV outbreaks have occurred.

INFECTIOUS DISEASES IN DENSE URBAN, SUBTERRANEAN ENVIRONMENTS

As war disrupts sewage, clean water, and other infrastructure in dense, urban environments, novel disease threats will emerge, threatening inadequately protected Warfighters.

TRACKING THE NEXT VIRAL THREAT

= Serosurveillance = Genomic surveillance = Vector pathogen discovery

The ability of influenza and other respiratory viruses to rapidly diffuse through crowded groups becomes especially relevant in military settings, where the virus can cause sudden illness in densely populated barracks and bases, rendering Soldiers incapable of performing duties. In collaboration with the University of Maryland, we surveil and investigate influenza and coronavirus spread in crowded dormitory settings, which are directly comparable to military barracks environments. Here, we are developing a genomic approach for precise tracking of contacts and virus spread, as well as investigating the impact of different building ventilation systems on the spread of respiratory pathogens.

In collaboration with U.S. Air Force School of Aerospace Medicine (USAFSAM), we are investigating the genomic epidemiology of adenovirus spread in active duty military and their dependents and monitoring changes that may result in the escape from adenovirus 4 and 7 vaccine. Similarly, with USAFSAM, we are tracking the spread of influenza in the above populations, especially infections in already vaccinated individuals, to investigate and track the emergence and spread of influenza vaccine escape.

Diarrhea ranked 1st among 57
infectious disease threats to the force based on its impact to readiness.

76%
of Soldiers in OIF and OEF experienced traveler's diarrhea early in their deployment.

TRAVELAN SHIGELLOSIS CHALLENGE COMPLETED

WRAIR, the Armed Forces Research Institute of Medical Science (an overseas WRAIR research directorate), and the Naval Medical Research Center partnered with Immuron to test Travelan against Shigella, enterotoxigenic Escherichia coli, Vibrio cholerae and Campylobacter jejuni isolates. Travelan is a natural product marketed for the prevention of traveler's diarrhea. In a recent pre-clinical study, Travelan prevented the development of shigellosis in 75% of those receiving therapy.

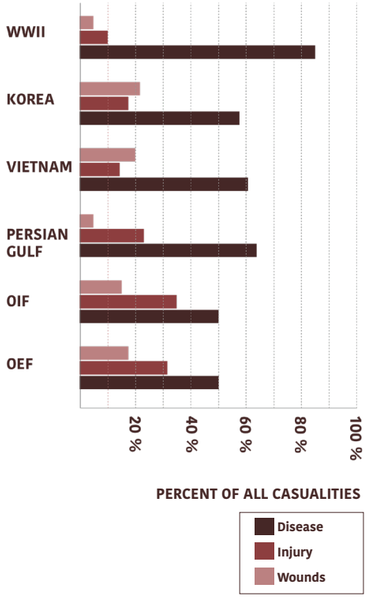
PHASE 2B CLINICAL TRIAL FOR SHIGELLA VACCINE

In Western Kenya, Shigella species represent 7%-12% of pathogens detected in acute diarrheal stool. Decreased susceptibility to a range of antibiotics over the past decade has complicated treatment for shigellosis.
A Phase 2B clinical trial to determine the efficacy of the Shigella sonnei vaccine, WRSs2, commenced in November, 2019, at Cincinnati Children's Hospital Medical Center. In 2020, the vaccine will be tested in seven sites in Kenya.

DIS-INTEGRATING DEPLOYMENT-RELATED INFECTIOUS DISEASES

American Soldiers in 140 countries face more than just the threat of enemy action; they also face endemic disease, to which they often do not have any protection from previous exposure. These pathogens are often highly contagious and can spread within a unit, decreasing the efficacy of an individual and their team.

DISEASE CAUSES MORE CASUALITIES THAN ENEMY ACTION



COMPLETED PHASE 3 OF DENGUE VACCINE

WRAIR's Viral Disease Branch completes CMI testing for dengue Phase 3 tetravalent vaccine with Takeda Pharmaceutical. This is the first dengue vaccine that utilized cell mediated immunity read-outs as a primary end-point. Takeda, in partnership with the Walter Reed Army Institute of Research, performed early (Phase 1) work on this vaccine candidate showing the robust CMI responses elicited from vaccination. WRAIR Viral Disease Branch was selected as the sole lab for CMI testing of a subset of the 30,000 subject Phase 3 clinical trial.

FIRST DENGUE VACCINE CHALLENGE STUDY

The Viral Disease Branch secured an important partnership with the University of Maryland Center for Vaccine Development to execute the first dengue vaccine challenge study, where volunteers are safely exposed to dengue infection to test vaccine candidates in field-like settings. This partnership allows the utilization of the WRAIR Clinical Trials Center for vaccine evaluation and a partner in close proximity to execute the challenge phase.

MALARIAL MOSQUITOES THAT CAN MIGRATE LONG DISTANCES ON HIGH LEVEL WIND CURRENTS IDENTIFIED

A global team including scientists from the Walter Reed Biosystematics Unit, housed within the Smithsonian National Museum of Natural History and part of the Walter Reed Army Institute of Research, used balloons to capture insects up to 290 meters in the air in the Sahel of Mali. Publishing these findings in Nature, it was demonstrated that previously blood-fed, malaria vectors frequently migrate over hundreds of kilometers, almost certainly spread malaria over such distances. This study has significant implications for malaria prevention and elimination as military entomologists can no longer focus solely on endemic mosquitoes and disease threats.

COMPLETED THE LARGEST CHMI TRIAL

Building on previous studies conducted at WRAIR, researchers conducted the largest controlled human malaria infection study ever, where 130 healthy adult subjects in five experimental cohorts were safely exposed to malaria to test the RTS,S malaria vaccine. Results from this trial provide valuable information about the vaccine's durability of protection against *Plasmodium falciparum* malaria and suggest that one formulation, the pediatric formulation, may be able to function as a universal formulation. WRAIR, with its partners, was honored with a 2019 Innovating for Impact Award by the Global Health Technologies Coalition for their work with the RTS,S vaccine. Malaria remains one of the most significant infectious disease threats to deployed Service Members.

DRUG DEVELOPMENT STRATEGY VALIDATED WITH TRIAZINE ANTIMALARIAL COMPOUNDS

Triazine compounds, tested under a selective next generation development effort for drugs to treat and prevent malaria, completed exploratory investigational new drug "Phase 0" testing and received the 2018 Invention of the Year award from USAMRDC. Ultimately, additional non-clinical data collected in spring, 2019, in combination with the results from the Phase 0 trial, supported a decision to terminate all triazine product development efforts. This industry-standard testing paradigm identifies products at the earliest point of non-compliance with the DOD malaria prophylaxis target product profile established by drug researchers; this "quick kill" and portfolio-driven philosophy positions WRAIR to elevate the next candidates in the pipeline and pursue clinical transition far sooner than earlier project-driven approaches.

NEW DIAGNOSTIC TOOL IMPROVES CHMI PROCESS

In collaboration with MHRP/DLDM, completed validation of a Laboratory Developed PCR assay conducted in a Certified Authorization Professional laboratory targeting an FDA cleared biomarker, 18S rRNA, for the clinical diagnosis of malaria infection in a CHMI trial in naïve adults. Utilization of this assay improves subject safety through earlier diagnosis before symptoms develop and significantly reduced clinical trials cost through elimination of a hotel phase during the malaria challenge.

ENTOMOLOGY

SEQUENCED THE GENOMES OF THREE NOVEL MOSQUITOES

Members of the Walter Reed Biosystematics Unit, a part of WRAIR which is housed within the Smithsonian National Museum of Natural History, worked with WRAIR viral diseases researchers to achieve whole genome assemblies for three New World Anopheles mosquito species. To date, WRBU has sequenced 160 whole genomes (including 110 new species). These data allow for forward-facing solutions, identifying specific areas of interest for future vector countermeasure development.

PUBLISHING THE FIRST GLOBAL MOSQUITO ATLAS IN 35 YEARS

Three authors who either have been or are civilian heads of Walter Reed Biosystematics Unit, a part of WRAIR and housed within the Smithsonian National Museum of Natural History, published a 1,200 page, two-volume book, "Mosquitoes of the World." The book, placed into production by Johns Hopkins Press, covers mosquito biology, systematics and includes a revised taxonomic catalog of mosquitoes including updated current distribution, key works and taxonomic histories for all 3,527 known taxa. The book will be available for purchase June 2020 and will be the only resource of its kind developed within the last 35 years. This resource cements WRBU as an internationally renowned resource for mosquito identification, supporting novel entomological countermeasures to protect the Warfighter.

WRAIR RESEARCHERS STUDY NEW MOSQUITO BAIT

Entomology researchers published a study in the Journal of Medical Entomology that sodium ascorbate (SA), a naturally-occurring antioxidant compound found in fruits and vegetables, can be added to attractive toxic sugar baits as a vector control tool for mosquitoes and sand flies. Since SA is available commercially in the United States as an additive or supplement, pest and vector control personnel can easily access the compound to enhance several existing vector control technologies.

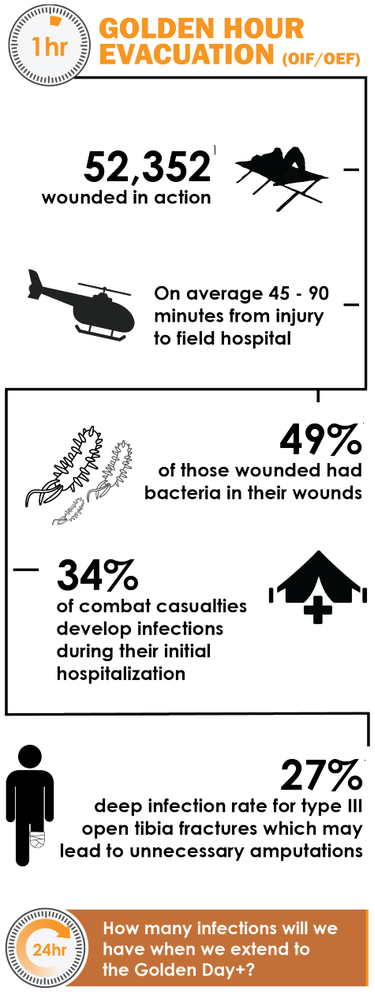
PROLONGED FIELD CARE IMPLICATIONS

During near-peer competition, air superiority diminishes, limiting availability to evacuate Soldiers from the point of injury limiting Warfighter sanitation, treatment and resupply capabilities. WRAIR is developing new, far-forward preventive and therapeutic interventions that extend the golden hour to the golden day+, which is required to sustain a lethal and responsive force during large-scale combat operations.

CHALLENGES OF MULTIDRUG RESISTANCE

The 2019 U.S. Military Infectious Diseases Threat Prioritization Panel named multidrug-resistant bacteria (MDR) as one of the highest tier 1 infectious disease threats, recognizing the high operational risk associated with these pathogens.

As the U.S. military executes its missions worldwide, health care providers in military medical treatment facilities are faced with the dilemma of how to treat infections caused by MDR bacteria, a challenge made worse in operational environments.



WRAIR's therapeutic bacteriophage

FIRST BACTERIOPHAGE COCKTAIL VIALED

Due to the sharp rise in pandrug-resistant bacterial pathogens like *Pseudomonas aeruginosa* and Staphylococcus aureus, WRAIR's Bacterial Disease Branch (BDB) is pioneering novel treatment strategies such as bacteriophage cocktails. Mixtures of viruses that specifically target bacteria of interest, a cocktail including five bacteriophages was found effective against 75% of *P. aeruginosa* strains circulating worldwide with work ongoing to test it against novel strains. Recently, an emergency Investigative New Drug application for a P. aeruginosa phage cocktail developed by BDB and vialed by WRAIR's Pilot Bioproduction Facility was submitted to the FDA for use in a patient.

LEVERAGING STRUCTURE -BASED DRUG DESIGN

WRAIR is the home of the Army's only center for x-ray crystallography for antibiotic discovery. Our state-of-the-art x-ray crystallization allows us to better design countermeasures. WRAIR has developed and is optimizing effective inhibitors against *A. baumannii & K. pneumoniae*, two gram-negative bacteria that were often isolated during OIF/OEF. Wound infections by these organisms are often highly resistant to most antibiotics.

PRE-CLINICAL MODELS DEVELOPED

WRAIR has developed pre-clinical models involving complex polytrauma and infection to understand how wound contamination turns into infection. WRAIR has developed a combat trauma model involving blast to better simulate battlefield-like wounds.

MRSN RESPONDS TO OVER 50 OUTBREAKS

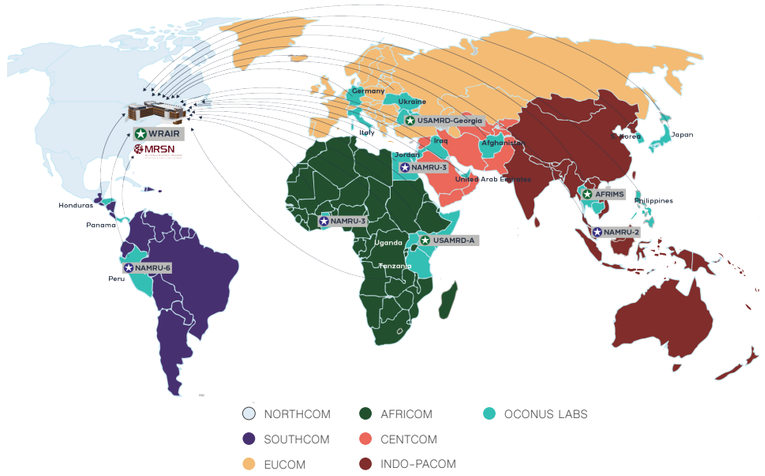
The Multidrug Resistant Organism Repository and Surveillance Network conducted over 50 outbreak investigations within military treatment facilities and remains the DOD's premier laboratory for whole genome sequencing and bioinformatics for multidrug-resistant bacterial pathogens.

Using WGS, the MRSN was able to show that infections in two recruits were not identical to one implicated in a fatal case involving another recruit at Fort Benning, Ga. This information was instrumental in reassuring the Fort Benning Command, and by extension the relatives and family members of new Army recruits, that there was no evidence for an extended hospital-borne outbreak among new recruits at Fort Benning.

Through close relationships with Air Force microbiologists at Bagram Air Force Base, the MRSN was able to comprehensively identify the presence of high levels of "superbugs" in Afghanistan, leading to increased awareness of this threat throughout the Military Healthcare System and the CENTCOM area of responsibility.

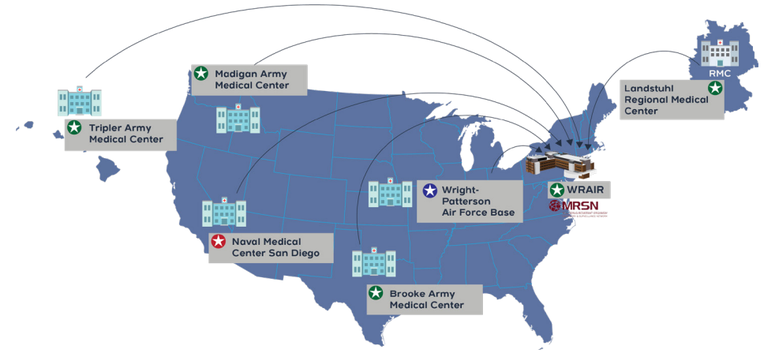
This partnership resulted in direct reports to the geographic combatant commands that culminated in the recent identification of "superbug" colonization in a severely wounded Soldier receiving treatment at Brooke Army Medical Center, San Antonio, Texas. This real-time surveillance is critical in alerting healthcare providers to emerging threats and ensuring appropriate responses to pandrug-resistant bacterial pathogens.

GLOBAL ANTIBIOTIC RESISTANCE SURVEILLANCE



- OCONUS and Global Emerging Infections Surveillance (GEIS)-funded labs in 22 countries
- Thousands of bacteria collected per year
- Track superbugs worldwide
- Provide actionable infectious disease surveillance data to geographic combatant commands

DISEASE OUTBREAKS IN THE MILITARY HEALTHCARE SYSTEM



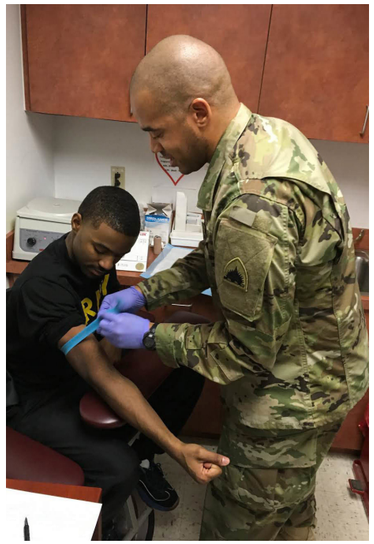
DISEASE OUTBREAK INVESTIGATIONS IN THE MHS

- Response assistance requested by healthcare professionals
- 6-8 outbreak investigations per month
- Turnaround time as short as 48-72 hours

MTF MDR ORGANISMS SURVEILLANCE

- All MTFs send MDR bacteria to MRSN in accordance with DOD/DHA policy
- 500-800 bacterial samples per month received from around the world
- MRSN performs real-time molecular epidemiology

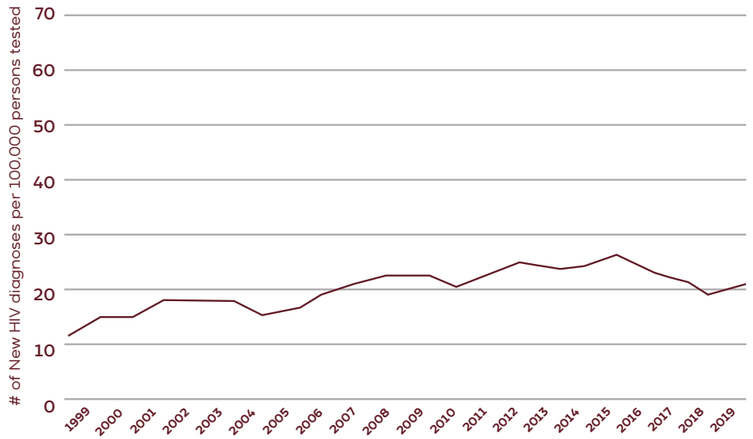
INFECTIOUS DISEASES WITH HIGH COSTS FOR THE MHS: HIV



The impacts of HIV are widespread and include lowered life expectancy, reduced economic growth and increased health costs. These outcomes ultimately damage social and political cohesion and impede the advancement of global health objectives—posing a risk to national security and the stability of many nation-states.

PEPFAR's programs help to restore the economic productivity of those infected or affected by HIV and to protect families, communities, and societies from destabilization. Higher levels of PEPFAR funding in a country is associated with greater improvements in World Bank indicators of governance, including: government effectiveness, regulatory quality, and a 31% improvement in the rule of law.

HIV RATES, U.S. ARMED FORCES, 1990-2019



DOD NUMBERS

350
NEW CASES OF HIV PER YEAR

$435,200
ESTIMATED LIFETIME COST FOR TREATMENT PER PERSON

$150 MILLION
ADDITIONAL FINANCIAL BURDEN TO THE DOD/VA ANNUALLY

- HIV-infected Soldiers can face deployment limitations, compromising unit integrity and their ability to compete in the multi-domain environment.
- WRAIR's MHRP's threat assessment research informs policy development and public health practices to decrease the rates of HIV and other STIs in the military.
- WRAIR's HIV Diagnostic and Reference Laboratory (HDRL) conducts state-of-art HIV screening and supplemental confirmatory testing, clinical and therapeutic monitoring services for U.S. military personnel.

POTENTIAL TARGET IDENTIFIED: THREE NEUTRALIZING ANTIBODY LINEAGES

Three neutralizing antibody lineages were identified in an HIV-infected individual, insights which may help inform vaccine design. Researchers analyzed longitudinal samples from an HIV-infected individual who was part of WRAIR's Military HIV Research Program (MHRP)'s RV217 acute infection cohort, a multi-site study led by MHRP in East Africa that has captured samples from some of the earliest stages of HIV infection. Antibodies in this individual targeted the membrane-proximal external region (MPER) of the HIV-1 envelope, a site of vulnerability that may hold promise as a potential HIV vaccine target. The findings were published in the journal *Immunity.*

TOWARD A FUNCTIONAL CURE: ANTIBODY PROLONGED TIME TO HIV VIRAL REBOUND

Infusion of a broadly neutralizing antibody (bNAb) in virally suppressed, early treated volunteers was associated with a modestly delayed rebound of HIV after interruption of antiretroviral therapy (ART). The study, the first randomized controlled trial to demonstrate this effect of VRC01, was led by the MHRP and the Thai Red Cross AIDS Research Centre. The study is part of a portfolio of MHRP's HIV remission research that seeks to find treatments to suppress the virus without a need for lifelong ART. Researchers evaluated the use of VRC01 in a small cohort of Thai men (RV254) who were diagnosed and initiated ART within the first month of HIV infection, and who had been virally suppressed for about three years. Results were published in the *Lancet HIV.*

65,000+ YOUNG WOMEN ENROLLED IN DREAMS INITIATIVES

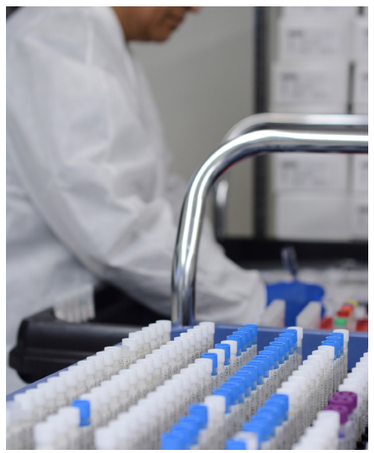
WRAIR's MHRP's partner sites in Uganda, Kenya and Tanzania have enrolled more than 65,000 young women in PEPFAR's DREAMS public-partnership initiatives. This program aims to keep them Determined, Resilient, Empowered, AIDS-free, Mentored and Safe through education, vocational training and other evidence-based interventions. As of 2019, WRAIR's MHRP and partners provide lifesaving antiretroviral treatment to more than 350,000 individuals with PEPFAR support.

NEW CORRELATE IDENTIFIED

MHRP scientists identified a transcriptional signature in B cells associated with protection from SIV or HIV infection in five independent studies of HIV-1 vaccine candidates. The gene expression signature was found to correlate with protection in the only human HIV vaccine trial that previously showed modest efficacy, the WRAIR-led RV144. This new correlate of protection provides a clue as to why the vaccines were partially protective previously and may help to understand the mechanisms of efficacy in ongoing efficacy studies. Results were published in *Science Translational Medicine.*

ALFQ VACCINE ADJUVANT AWARDED A PATENT

In the 1990s, MHRP at the Walter Reed Army Institute of Research developed a family of new adjuvants called the Army Liposome Formulation (ALF), and the ALFQ recently was awarded a patent. Adjuvants are vaccine components that help activate the immune system and improve immune responses. MHRP will be evaluating the effect of these promising new compounds on vaccine responses in various HIV vaccine clinical trials in Kenya and Thailand in 2020. It will also be tested with vaccines for malaria, enteric diseases and heroin.



BATTLEFIELD RESILIENCE: FORGING SOCIAL COHESION

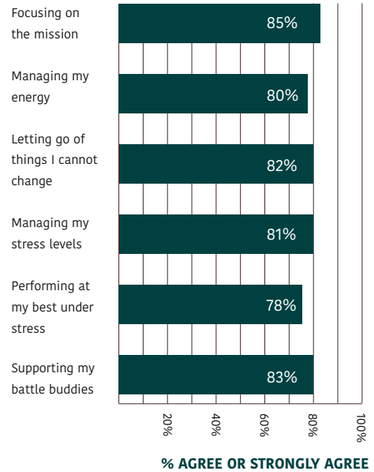
In multi-domain operations (MDOs), small teams are essential for mission performance. These teams must be able to sustain themselves in remote locations and function independently of larger units. To perform optimally, these teams, though disaggregated, must be characterized by a culture of support that offers a network of connection, essential for promoting resilience under difficult, arduous conditions.

ACE GATEKEEPER TRAINING

USAMRD-West, in collaboration with WRAIR-RTO, is evaluating the newly developed version of the ACE gatekeeper training (i.e., "ACE-SI") for the Army Resilience Directorate. The goal of this training is to provide Soldiers with the knowledge and skills to temporarily intervene with Soldiers at risk for suicide until the Soldier can be connected to appropriate health resources. USAMRD-West's researchers are coordinating closely with WRAIR-RTO and the Army Public Health Center (APHC). This effort highlights WRAIR's continued engagement with emergent Army requirements, in support of Warfighter health and resilience.

RESILIENCE ENHANCEMENT TRAINING FIELDED

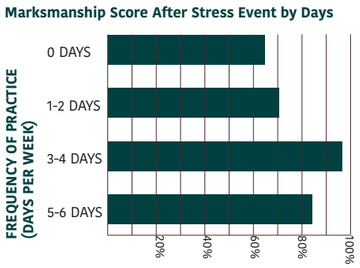
Soldiers need field-ready resilience tools that can help them manage the ongoing psychological demands of deployment. Partnering with the Army Resilience Directorate, WRAIR developed performance and resilience enhancement (PRE) skills for training at pre-deployment. Program evaluations of the training showed high acceptability among deploying Soldiers. Ratings from 286 Security Force Assistance Brigade Soldiers just before deploying to Afghanistan showed:



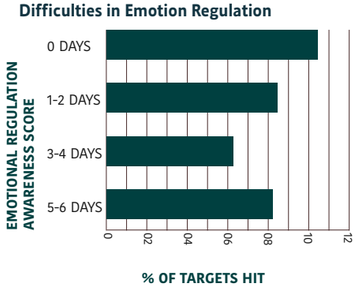
MINDFULNESS IMPROVES HEALTH & OPERATIONAL OUTCOMES

WRAIR's Research Transition Office completed the first randomized trials to investigate the impact of mindfulness training on Soldier operational performance. The studies, funded by the Army Resilience Directorate, showed:

Soldiers practicing mindfulness on a regular basis scored 20% better on target accuracy



More practice was associated with fewer difficulties in regulating emotions



In response to the study findings, LTG Piatt, Director of Army Staff, directed SR2 to develop plans to roll out mindfulness training in selected TRADOC and FORSCOM units.

BLAST, BRAIN INJURIES, AND NEUROPROTECTION

Since 2000, 383,947 Warfighters, mostly Soldiers, have been diagnosed with traumatic brain injury (TBI). Most are Army Soldiers. Causes for this injuries include: repetitive and acute blunt impact, repetitive and acute blast exposure, and acceleration/deceleration forces. Over 80 percent of these injuries have been diagnosed as "mild" TBI. Even though the majority of these injuries are classified as mild, early diagnosis and treatment is essential for optimal results. The quicker a Warfighter is diagnosed and treated, the quicker they recover.

In future multi-domain operations (MDO), Warfighters must be able to acquire, understand, synthesize, and convert into new information into real-time decision-making. Lack of air superiority and control in the warfare with near-peer adversaries may increase causalities from polytrauma (including brain injuries). Second only to hemorrhage, severe penetrating TBI represents our most significant debilitating and life-threatening trauma. Military planning for future multi-domain battlefields project higher numbers of trauma casualties with greater injury severities in an environment where direct support or medical evacuation may not be available for extended periods of time.

Efficient countermeasures, therapeutic and prevention with personal protective equipment, would Warfighters lethality that is directly relevant to MDO-2028 doctrine. In addition, successful Warfighters need to be at their cognitive, physical, and emotional peak. Unfortunately the consequences of TBI, although unique to the individual, include symptoms that may hinder or prevent a Warfighter from reaching their optimal performance, namely, headaches, dizziness, fatigue, degraded cognitive performance, and difficulty sleeping. Thus, innovative in-theater solutions are needed to promptly diagnose, treat, and return Warfighters to peak performance.

CHRONIC NEUROBEHAVIORAL EFFECTS OF BLAST EXPOSURE

Blast-Induced Neurotrauma Branch researchers published the first study showing the chronic neurobehavioral effects of blast exposure from day 1 to 12 months post-blast in an experimental animal model (doi: 10.1089/neu.2019.6591). They documented acute changes in neurobehavioral functions followed by a recovery during sub-acute stages and subsequent significant deficits at 6 and 12 months, comparable to the changes observed in blast exposed victims. Understanding the primary and secondary neuropathological mechanisms responsible for changes in neurobehavioral functions will results in effective countermeasures.

MORE OPPORTUNITY FOR TBI THERAPEUTIC INTERVENTIONS

Brain Trauma Neuroprotection Branch demonstrated that there are two phases of post-injury responses to mitochondrial bioenergetics failure in the brain--failure at the injury core region followed by delayed bioenergetics failure in the distal region from the injury. These findings identified a wider window of opportunity for therapeutic interventions targeting mitochondrial dysfunction after TBI, and suggest an extended drug therapeutics be necessary to achieve long-term efficacy.

MRDC'S FIRST TRANSITION RESPONSE TEAM (TRT)

The Research Transition Office stood up MRDC's first Transition Response Team (TRT) in partnership with the the U.S. Army Medical Materiel Development Activity. The TRT deployed to the USCENTCOM area of responsibility in March, 2019, to gather feedback at eight bases in Kuwait, Afghanistan, and Iraq on the feasibility and effectiveness of two TBI-detection devices under consideration for wide-spread fielding. The results from the TRT enabled the Army Surgeon General, the USCENTCOM Command Surgeon, and the Joint Staff Surgeon to provide the best military medical guidance to senior military and congressional leaders on the far-forward utility of current TBI-detection devices.

FAR-FORWARD BEHAVIORAL HEALTH

Combat exposure is a robust predictor of mental health problems in U.S. Soldiers. PTSD with severe functional impairment prevalence estimates range from 8.5% to 14.1%, and up to 30% with some functional impairment (Thomas et al., 2010). The number of Soldiers experiencing acute or chronic stress-related symptoms related to combat operations is not clearly defined, but certainly greater than those meeting diagnostic criteria for PTSD (underreporting of symptoms is common due to stigma and career concerns). Data from Mental Health Advisory Teams, WRAIR-led efforts to embed mental health professionals within deployed units to gather behavioral health data for unit Commanders, show almost 50% of Soldiers report experiencing a unit member unable to function due to stress.

Evacuation for mental health problems accounted for nearly a quarter of all medical evacuations (CENTOM, AFHSB, 2017 and 2018), only behind musculoskeletal injury. The loss in force readiness and strength is significant. For instance, those evacuated for mental health reasons are four times more likely to separate from service (Peterson, Hale, 2018, Mil Med). Finally, the annual cost for treatment for post-traumatic stress-related symptoms in Veteran's is as high as 3 billion dollars (Institute of Medicine, 2017).

The nature of the war and the battlefield are anticipated to change to a multi-domain operations (MDO), and the research has to shift to meet this change. The MDO will be characterized by low density teams dispersed in austere environments with limited communications, a dearth of professional medical support, and an inability for immediate evacuation. Concurrent physical, cognitive, and emotional demands on Soldiers will be greater than before, increasing vulnerability for stress-related difficulties and acute and significant reductions in Force readiness and lethality. Immediate and rapid solutions will be required to keep Soldiers in the fight and minimize the impact of stress on cognitive, emotional, and physical function.

BEHAVIORAL HEALTH READINESS (BHR) DECISION SUPPORT TOOLS

The Military Psychiatry Branch developed two behavioral health readiness (BHR) decision support tools and associated training which provides guidance on the BHR decision-making process, the overall military profile system and associated regulations, and a real-time check on clinical decision-making processes and skills, augmenting clinical judgment. The BHR decision support tools will help inform readiness for return to duty from psychological injury. Data in support of the study were evaluated at five sites with over 300 behavioral health providers trained in conjunction with the Office of the Surgeon General. These tools are expected to be transitioned in 2020.

PTSD BLOOD BIOMARKERS SCREENING TOOL

WRAIR's Medical Readiness Systems Biology Branch completed a blood biomarker screening companion tool for post-traumatic stress disorder (PTSD) to objectively detect possible PTSD and/or subgroup characteristics of PTSD. This screen could have implications for the far-forward setting as well as during periodic health assessments for personnel exposed to traumatic experiences. The screening tool will provide support for soldier's readiness through objective detection, and will reduce the bias accompanying underreporting of symptoms the conventional screening solutions. An article was featured on Military times relating to this study that was recently published in the *Journal of Molecular Psychiatry.*

WARFIGHTER FATIGUE MANAGEMENT

The sleep research team (SRT) has been developing novel interventions for the past decades. WRAIR developed the first actigraph that is now worn on the wrists of most Americans. We developed the SAFE-T model now utilized by the commercial airline industry to regulate the sleep and wake schedule for pilots and crews. WRAIR continues to be at the cutting edge, developing personalized, machine learning optimized strategies to individualize recommendations for sleep and caffeine intake. Recommendations for improving sleep in the general population are often inappropriate for military personnel in high OPTEMPO operational environments. WRAIR's SRT continues to develop and transition solutions for the unique and increasingly complex military operational environment.

TRANSCRANIAL ELECTRICAL STIMULATION (tES) SLOWS PERFORMANCE DECLINES DURING SLEEP DEPRIVATION

WRAIR's researchers were able to show that tES applied during a two hour sleep opportunity slowed performance declines in a subsequent 46 hours total sleep deprivation challenge and helped individuals return to baseline faster during recovery. The purpose of this study was to determine if the enhancement of electroencephalographic (EEG) slow-wave activity using transcranial electrical stimulation (tES) at Slow Oscillation (SO) frequency, during a restricted period of nocturnal sleep, enhances the restorative properties of that period of sleep and improves performance during a subsequent period of sleep deprivation.

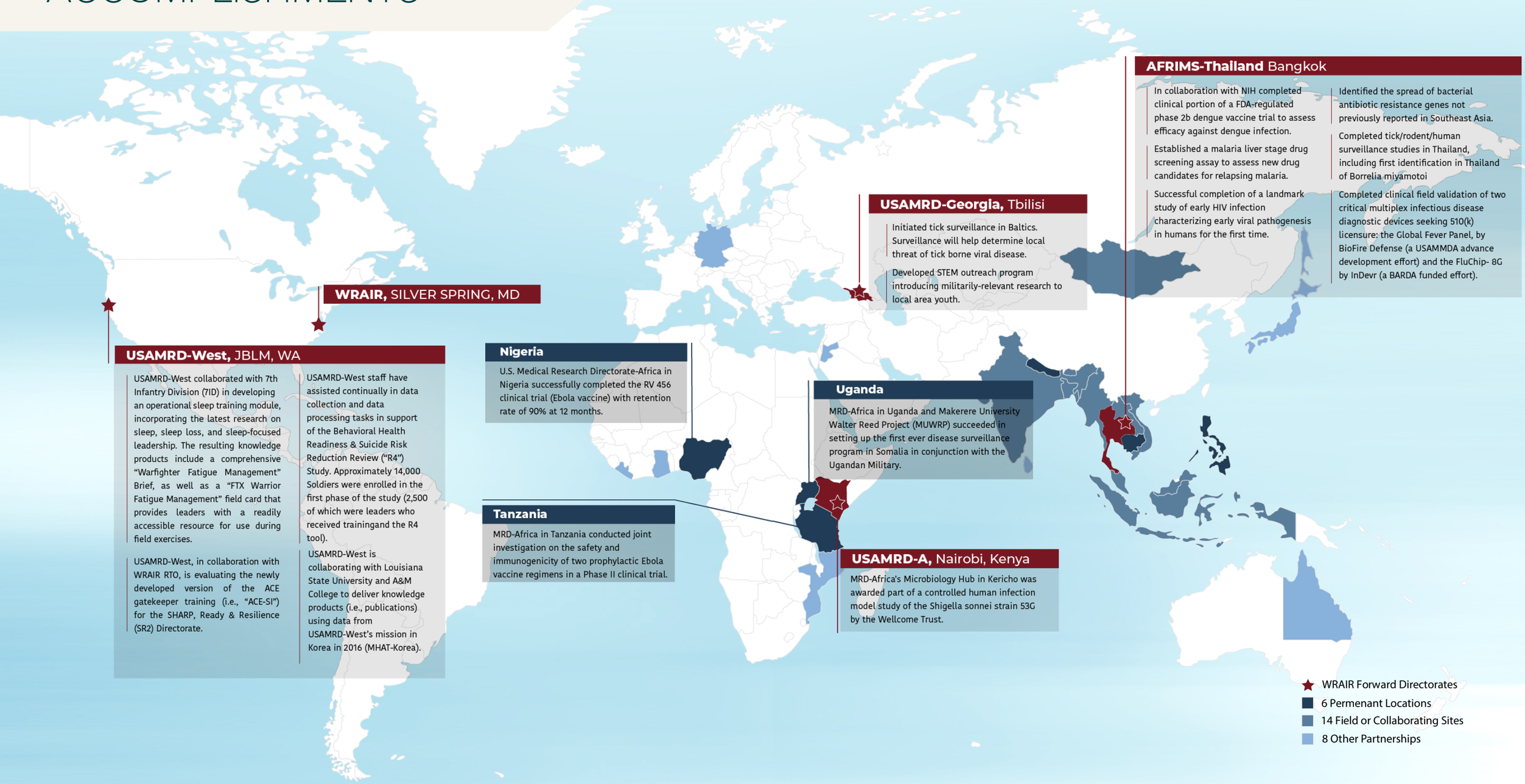
7ID WARFIGHTER FATIGUE MANAGEMENT TOOLS

USAMRD-West collaborated with 7th Infantry Division (7ID) to developing an operational sleep training module, incorporating the latest research on sleep, sleep loss, and sleep-focused leadership. The module is targeted to company-, battalion-, and brigade-level leaders within the Division and addresses relevant operational sleep tactics and integration of sleep planning into field operations. The resulting knowledge products include a comprehensive "Warfighter Fatigue Management" Brief, as well as a "FTX Warrior Fatigue Management" field card that provides leaders with a readily-accessible resource for use during field exercises. These products highlight WRAIR's continued relevance to the operational force.

TRANSITIONED THE 2B-ALERT PERFORMANCE MODEL

WRAIR transitioned the 2B-Alert performance model to the U.S. Army Medical Materiel Development Activity. 2B-Alert is the world's only performance prediction model that individualizes wakefulness with dosage and timing for optimal caffeine use. The Sleep Research Center worked in concert with Biotechnology High Performance Computing Software Applications Institute (BHSAI) to develop and refine this model which was recently non-exclusivel y licensed to an Australian company, Integrated Safety Support, through assistance of the USAMRDC Office of Medical Technology Transfer. Assessing Soldier fatigue in real time and providing recommendations to improve performance provides meaningful improvements to split-second decision making, learning and other skills vital to adequate function in a high-stress multi-domain environment; additionally, in far-forward settings with limited resupply, it can help conserve limited resources for use when they are truly needed.

WRAIR–FORWARD LAB ACCOMPLISHMENTS



WRAIR, SILVER SPRING, MD

USAMRD-West, JBLM, WA

USAMRD-West collaborated with 7th Infantry Division (7ID) in developing an operational sleep training module, incorporating the latest research on sleep, sleep loss, and sleep-focused leadership. The resulting knowledge products include a comprehensive "Warfighter Fatigue Management" Brief, as well as a "FTX Warrior Fatigue Management" field card that provides leaders with a readily accessible resource for use during field exercises.

USAMRD-West, in collaboration with WRAIR RTO, is evaluating the newly developed version of the ACE gatekeeper training (i.e., "ACE-SI") for the SHARP, Ready & Resilience (SR2) Directorate.

USAMRD-West staff have assisted continually in data collection and data processing tasks in support of the Behavioral Health Readiness & Suicide Risk Reduction Review ("R4") Study. Approximately 14,000 Soldiers were enrolled in the first phase of the study (2,500 of which were leaders who received trainingand the R4 tool).

USAMRD-West is collaborating with Louisiana State University and A&M College to deliver knowledge products (i.e., publications) using data from USAMRD-West's mission in Korea in 2016 (MHAT-Korea).

Nigeria

U.S. Medical Research Directorate-Africa in Nigeria successfully completed the RV 456 clinical trial (Ebola vaccine) with retention rate of 90% at 12 months.

Tanzania

MRD-Africa in Tanzania conducted joint investigation on the safety and immunogenicity of two prophylactic Ebola vaccine regimens in a Phase II clinical trial.

Uganda

MRD-Africa in Uganda and Makerere University Walter Reed Project (MUWRP) succeeded in setting up the first ever disease surveillance program in Somalia in conjunction with the Ugandan Military.

USAMRD-A, Nairobi, Kenya

MRD-Africa's Microbiology Hub in Kericho was awarded part of a controlled human infection model study of the Shigella sonnei strain 53G by the Wellcome Trust.

USAMRD-Georgia, Tbilisi

Initiated tick surveillance in Baltics. Surveillance will help determine local threat of tick borne viral disease.

Developed STEM outreach program introducing militarily-relevant research to local area youth.

AFRIMS-Thailand Bangkok

In collaboration with NIH completed clinical portion of a FDA-regulated phase 2b dengue vaccine trial to assess efficacy against dengue infection.

Established a malaria liver stage drug screening assay to assess new drug candidates for relapsing malaria.

Successful completion of a landmark study of early HIV infection characterizing early viral pathogenesis in humans for the first time.

Identified the spread of bacterial antibiotic resistance genes not previously reported in Southeast Asia.

Completed tick/rodent/human surveillance studies in Thailand, including first identification in Thailand of Borrelia miyamotoi

Completed clinical field validation of two critical multiplex infectious disease diagnostic devices seeking 510(k) licensure: the Global Fever Panel, by BioFire Defense (a USAMMDA advance development effort) and the FluChip- 8G by InDevr (a BARDA funded effort).

- WRAIR Forward Directorates
- 6 Permenant Locations
- 14 Field or Collaborating Sites
- 8 Other Partnerships

THE BUSINESS OF SCIENCE

PILOT BIOPRODUCTION FACILITY

WRAIR's Pilot Bioproduction Facility (PBF), a small good manufacturing practices-compliant manufacturing facility for vaccines and biologics, completed a full renovation in 2019; managed by the Army Corps of Engineers, the renovation brought the PBF to modern standards and dramatically expanded production capability. Capable of supporting pre-clinical and early-stage clinical testing, the PBF can also meet a DOD-wide need and serve as a critical part of a nationwide response to provide durable solutions to infectious disease. The facility is expected to be fully online midway through 2020.

PILOT BIOPRODUCTION FACILITY VIALS PHAGE

WRAIR Pilot-Bioproduction Facility (PBF) helped prepare bacteriophage therapeutic cocktail as experimental treatment against multidrug resistant *P. aeruginosa* infection to be used under an emergency IND. Despite not being fully up and running in GMP mode yet, the PBF filled 100 vials of P. aeruginosa mixture for use in an e-IND. This material is intended to initially be administered to a patient with a deep P. aeruginosa infection in a leg wound that is not responding to antibiotic treatment. If it works, it will save amputation of the affected leg. The PBF was able to turn this around from a request for vials and stoppers to a full process, complete with significant cGMP documentation and methodology in less than two weeks, even though the facility is not yet ready for full cGMP production. There is reason to believe that, if this is successful, the PBF can help with other phage mixtures in the future.

CLINICAL TRIALS CENTER ACCOMPLISHMENTS

1 CTC validated a new lot of malaria parasites to be used for malaria challenge trials throughout the world for the next 30 years. This trial will allow for replacement of the old lot of which nearly all the vials had been expended. This trial also generated the first clinical data for WRAIR's new PCR capabilities that can be used to modernize WRAIR's malaria challenge trials.

2 CTC completed a first-in-human trial with the VLP malaria vaccine in collaboration with VLP therapeutics. This challenge trial was done to test the efficacy of a vaccine that uses an alphavirus particle to demonstrate malaria antigens which had the potential to protect against the malaria parasite and the alphavirus the VLP is derived from.

3 CTC is starting a first-in-human trial in collaboration with Sanofi for an urgently needed improvement to one of the world's most successful vaccines. The yellow fever vaccine, developed in the 1930s, generates an excellent long-term immune response. However, the vaccine must be incubated/developed in chicken embryos which leads to production bottlenecks that have cause stock piles to be depleted during the last two outbreaks. The new vaccine is based on the original vaccine and has performed similarly in preclinical testing; this vaccine is produced in Vero cells which allow a much greater increase in production capability. Given the ongoing need and similarity to the predicate vaccine, very rapid development is anticipated for this first-in-human trial to move to FDA approval.

4 The WRAIR CTC, in collaboration with scientists at the NIH's Vaccine Research Center, finished a critical first in human Marburg vaccine clinical trial in 2019. This Marburg vaccine used a novel strategy involving a replication-deficient recombinant chimpanzee adenoviral vector in combination with a portion of the Marburg viral glycoprotein. Marburg disease is similar to Ebola in its clinical symptoms, and its mortality rate may even be higher. This important vaccine's development timeline was accelerated in part due to the 2017 outbreak in Uganda where five people were infected and three died; ongoing Marburg outbreaks intermittently affect sub-Saharan Africa and threaten global health security. A similar Ebola vaccine developed by the VRC was tested in 2016-2017 and determined to be safe and immunogenic.

WRAIR'S CY2019

PUBLICATIONS

PUBLICATIONS
341

59% were co-authored with international collaborators

38.2% were in the top 10% tiered journals

23.8% were cited among the top 10% most cited publications worldwide

10% were among the top 10% publications viewed worldwide

300 POSTER PRESENTATIONS

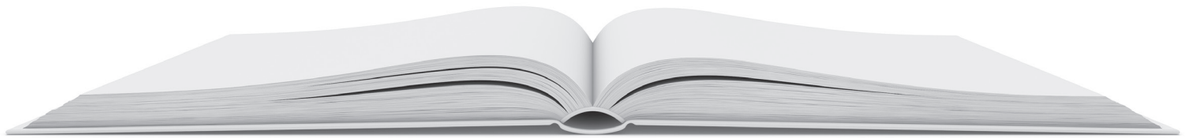
208 PRESENTATIONS AND TALKS

TOP **SIX** UNIVERSITIES CITING WRAIR'S RESEARCH

1. HARVARD UNIVERSITY
2. HARVARD MEDICAL SCHOOL
3. UNIVERSITY OF LONDON
4. UNIVERSITY OF CALIFORNIA SYSTEM
5. UNIVERSITY OF OXFORD
6. MAHIDOL UNIVERSITY

TOP **FIVE** TOPIC CLUSTERS

1. HIV
2. MALARIA
3. DENGUE & VIRAL DISEASES
4. SLEEP (WARFIGHTER FATIGUE)
5. TRAUMATIC BRAIN INJURY



JOURNAL ARTICLES OF 2019

Journal Articles Ranked By Impact Factor	Journal	Impact factor
Lacerda, M.V.G., Llanos-Cuentas, A., Krudsood, S. et al. (2019). Single-dose tafenoquine to prevent relapse of plasmodium vivax malaria. New England Journal of Medicine, 380(3) 215-228	The New England journal of Medicine	70.67
Biswal S, Reynales H, Saez-Llorens X, Lopez P, Borja-Tabora C, Kosalaraksa P, et al. Efficacy journal of medicine. 2019;381(21):2009-19.	The New England journal of Medicine	70.67
Huestis DL, Dao A, Diallo M, Sanogo ZL, Samake D, Yaro AS, et al. Windborne long-distance migration of malaria mosquitoes in the Sahel. Nature. 2019;574:404-8.	Nature	43.07
Amambua-Ngwa A, Amenga-Etego L, Kamau E, Amato R, Ghansah A, Golassa L, et al. Major subpopulations of Plasmodium falciparum in sub-Saharan Africa. Science (New York, NY). 2019;365(6455):813-6.	Science	41.063
Yelin I, Flett KB, Merakou C, Mehrotra P, Stam J, Snesrud E, et al. Genomic and epidemiological evidence of bacterial transmission from probiotic capsule to blood in ICU patients. Nature medicine. 2019;25(11):1728-32.	Nature Medicine	30.641
Tinto H, Otieno W, Gesase S, Sorgho H, Otieno L, Liheluka E, et al. Long-term incidence of severe malaria following RTS,S/AS01 vaccination in children and infants in Africa: an open-label 3-year extension study of a phase 3 randomised controlled trial. The Lancet Infectious diseases. 2019;19(8):821-32.	The Lancet Infectious diseases	27.516
JModjarrad K, Roberts CC, Mills KT, Castellano AR, Paolino K, Muthumani K, et al. Safety and immunogenicity of an anti-Middle East respiratory syndrome coronavirus DNA vaccine: a phase 1, open-label, single-arm, dose-escalation trial. The Lancet Infectious diseases. 2019;19(9):1013-22.	The Lancet Infectious diseases	27.516
Kulkarni S, Lied A, Kulkarni V, Rucevic M, Martin MP, Walker-Sperling V, et al. CCR5AS lncRNA variation differentially regulates CCR5, influencing HIV disease outcome. Nature immunology. 2019;20(7):824-34.	Nature Immunology	25.53
Kanekiyo M, Joyce MG, Gillespie RA, Gallagher JR, Andrews SF, Yassine HM, et al. Author Correction: Mosaic nanoparticle display of diverse influenza virus hemagglutinins elicits broad B cell responses. Nature immunology. 2019;20(6):765.	Nature Immunology	25.53
Krebs SJ, Kwon YD, Schramm CA, Law WH, Donofrio G, Zhou KH, et al. Longitudinal analysis reveals early development of three MPER-directed neutralizing antibody lineages from an HIV-1-infected individual. Immunity. 2019;50(3):677-91.e13.	Nature Immunology	23.53

JOURNAL ARTICLES OF 2019

1. Adney DR, Wang L, van Doremalen N, Shi W, Zhang Y, Kong WP, et al. Efficacy of an adjuvanted Middle East respiratory syndrome coronavirus spike protein vaccine in dromedary camels and alpacas. Viruses. 2019;11(3).
2. Adrian AL, Skeiky L, Burke TM, Gutierrez IA, Adler AB. Sleep problems and functioning during initial training for a high-risk occupation. Sleep health. 2019;5(6):651-7.
3. Agan BK, Ganesan A, Byrne M, Deiss R, Schofield C, Maves RC, et al. The US Military HIV Natural History Study: Informing military HIV care and policy for over 30 years. Military medicine. 2019;184(Suppl. 2):6-17.
4. Ake JA, Polyak CS, Crowell TA, Kiweewa F, Semwogerere M, Maganga L, et al. Noninfectious comorbidity in the African Cohort Study (AFRICOS). Clinical infectious diseases : an official publication of the Infectious Diseases Society of America. 2019;69(4):639-47.
5. Akhvlediani T, Chitadze N, Chlikadze R, Rostiashvili N, Betashvili M, Imnadze P, et al. Multivariate relationships between epidemiologic risk factors and zoonotic infections among military personnel in the country of Georgia: A non-linear canonical correlation analysis. Zoonoses and public health. 2019;66(7):835-41.
6. Akiner MM, Ozturk M, Baser AB, Gunay F, Hacioglu S, Brinkmann A, et al. Arboviral screening of invasive Aedes species in northeastern Turkey: West Nile virus circulation and detection of insect-only viruses. PLoS neglected tropical diseases. 2019;13(5):e0007334.
7. Aldersley A, Pongsiri A, Bunmee K, Kijchalao U, Chittham W, Fansiri T, et al. Too “sexy” for the field? Paired measures of laboratory and semi-field performance highlight variability in the apparent mating fitness of Aedes aegypti transgenic strains. Parasites & vectors. 2019;12(1):357.
8. Alger SE, Brager AJ, Capaldi VF. Challenging the stigma of workplace napping. Sleep. 2019;42(8):zsz097.
9. Alkhalil L, St. Pierre ME, Sowden WJ, Adler AB. Stationed in Alaska: Subjective winter stress and mental health. Mil behav Health. 2019;7(2):218-27.
10. Allan NP, Ashrafioun L, Kolnogorova K, Raines AM, Hoge CW, Stecker T. Interactive effects of PTSD and substance use on suicidal ideation and behavior in military personnel: Increased risk from marijuana use. Depression and anxiety. 2019;36(11):1072-9.
11. Amaratunga C, Andrianaranjaka VH, Ashley E, Bethell D, Bjorkman A, Bonnington CA, et al. Association of mutations in the Plasmodium falciparum Kelch13 gene (Pf3D7_1343700) with parasite clearance rates after artemisinin-based treatments-a WWARN individual patient data meta-analysis. BMC Med. 2019;17:20.
12. Amoah S, Mishina M, Praphasiri P, Cao W, Kim JH, Liepkalns JS, et al. Standard-dose intradermal influenza vaccine elicits cellular immune responses similar to those of intramuscular vaccine in men with and those without HIV infection. The Journal of infectious diseases. 2019;220(5):743-51.
13. Ananthaswamy N, Fang Q, AlSalmi W, Jain S, Chen Z, Klose T, et al. A sequestered fusion peptide in the structure of an HIV-1 transmitted founder envelope trimer. Nature communications. 2019;10(1):873.
14. Anderson MK, Anderson RJ, Tenenbaum LS, Kuehn ED, Brown HMK, Ramadorai SB, et al. The benefits of a near-peer mentoring experience on STEM persistence in education and careers: A 2004-2015 study. Journal of STEM Outreach. 2019;2:1-11.
15. Angliss G, Ebers KL, Landis-Hanna A, Vale A, Stomack K, Niino T, et al. Taking on pet obesity. Journal of the American Veterinary Medical Association. 2019;255(4):421-2.
16. Arcury-Quandt AE, Harbertson J, Ziajko L, Hale BR. Risk factors for positive depression screening across a shipboard deployment cycle. BJPsych open. 2019;5(5):e84.
17. Atre T, Phillips RL, Modjarrad K, Regules JA, Bergmann-Leitner ES. Development and characterization of a Zaire Ebola (ZEBOV) specific IgM ELISA. Journal of immunological methods. 2019;468:29-34.
18. Atre T, Robinson TM, Savransky T, Dutta S, Epstein JE, Bergmann-Leitner ES. Novel sporozoite-based ELISpot assay to assess frequency of parasite-specific B cells after vaccination with irradiated sporozoites. Malaria journal. 2019;18(1):186.
19. Bachovchin KA, Sharma A, Bag S, Klug DM, Schneider KM, Singh B, et al. Improvement of aqueous solubility of lapatinib-derived analogs: Identification of a quinolinimine as a lead for human African trypanosomiasis drug development. Journal of medicinal chemistry. 2019;62(2):665-87.
20. Bai H, Li Y, Michael NL, Robb ML, Rolland M. The breadth of HIV-1 neutralizing antibodies depends on the conservation of key sites in their epitopes. PLoS computational biology. 2019;15(6):e1007056.
21. Bailey ZS, Cardiff K, Yang XF, Gilsdorf J, Shear D, Rasmussen TE, et al. The Effects of Balloon Occlusion of the Aorta on Cerebral Blood Flow, Intracranial Pressure, and Brain Tissue Oxygen Tension in a Rodent Model of Penetrating Ballistic-Like Brain Injury. Frontiers in Neurology. 2019;10:1309.
22. Banlunara W, Techangamsuwan S, Pirarat N, Kaewamatawong T, Piewbang C, Kesdangsakonwut S, et al. Epizootic of multi-centric, squamous cell carcinomas in populations of Indo-Pacific humpbacked dolphins Sousa chinensis in Thai waters. Diseases of aquatic organisms. 2019;134(2):99-106.
23. Barnhart DA, Tsikhutsu I, Kirui D, Sawe F, Muli J, Sugut W, et al. Association of the US President’s Emergency Plan for AIDS Relief’s funding with prevention of mother-to-child transmission of HIV in Kenya. JAMA network open. 2019;2(9):e1911318.
24. Bartonjo G, Oundo J, Ng’ang’a Z. Prevalence and associated risk factors of transfusion transmissible infections among blood donors at Regional Blood Transfusion Center Nakuru and Tenwek Mission Hospital, Kenya. The Pan African medical journal. 2019;34:31.
25. Bashir IM, Nyakoe N, van der Sande M. Targeting remaining pockets of malaria transmission in Kenya to hasten progress towards national elimination goals: an assessment of prevalence and risk factors in children from the Lake endemic region. Malaria journal. 2019;18(1):233.
26. Bautista CT, Wurapa EK, Sanchez JL. Does the hazard of chlamydia increase with the number of gonorrhea diagnoses? A large population-based study among U.S. Army women. Journal of women’s health (2002). 2019;28(2):220-4.
27. Bayiyana A, Okurut S, Nabatanzi R, Zziwa G, Boulware DR, Lutwama F, et al. Longitudinal changes in CD4(+), CD8(+) T cell phenotype and activation marker expression following antiretroviral therapy initiation among patients with cryptococcal meningitis. Journal of fungi (Basel, Switzerland). 2019;5(3).
28. Benante JP, Fox J, Lawrence K, Fansiri T, Pongsiri A, Ponlawat A, et al. A comparative study of mosquito and sand fly (Diptera: Psychodidae: Phlebotominae) sampling using dry ice and chemically generated carbon dioxide from three different prototype CO2 generators. Journal of economic entomology. 2019;112(1):494-8.
29. Berry AA, Gottlieb ER, Kouriba B, Diarra I, Thera MA, Dutta S, et al. Immunoglobulin G subclass and antibody avidity responses in Malian children immunized with Plasmodium falciparum apical membrane antigen 1 vaccine candidate FMP2.1/AS02A. Malaria journal. 2019;18(1):13.
30. Billings E, Heipertz RA, Varleva T, Sanders-Buell E, O’Sullivan AM, Bose M, et al. HIV-1 genetic diversity and demographic characteristics in Bulgaria. PloS one. 2019;14(5):e0217063.
31. Billings E, Kijak GH, Sanders-Buell E, Ndembi N, O’Sullivan AM, Adebajo S, et al. New subtype B containing HIV-1 circulating recombinant of sub-Saharan Africa origin in Nigerian men who have sex with men. Journal of acquired immune deficiency syndromes (1999). 2019;81(5):578-84.
32. Black KJ, Britt TW, Lane ME, Adler AB. Newcomer engagement and performance strategies in a high-risk occupational context. Sport Exercise and Performance Psychology. 2019;8(3):334-51.
33. Blacksell SD, Robinson MT, Newton PN, Ruanchaimun S, Salje J, Wangrangsimakul T, et al. Biosafety and biosecurity requirements for Orientia spp. diagnosis and research: recommendations for risk-based biocontainment, work practices and the case for reclassification to risk group 2. BMC infectious diseases. 2019;19(1):1044.
34. Bliese PD, Maltarich MA, Hendricks JL, Hofmann DA, Adler AB. Improving the measurement of group-level constructs by optimizing between-group differentiation. The Journal of applied psychology. 2019;104(2):293-302.
35. Bodhidatta L, Anuras S, Sornsakrin S, Suksawad U, Serichantalergs O, Srijan A, et al. Epidemiology and etiology of traveler’s diarrhea in Bangkok, Thailand, a case-control study. Tropical diseases, travel medicine and vaccines. 2019;5:9.
36. Boonkerd N, Na-Ubon M, Tongtawe P, Thanongsaksrikul J, Bodhidatta L, Tapchaisri P, et al. Evolution among O1 hybrid and El Tor variant Vibrio cholerae O1 strains in Thailand. Southeast Asian Journal of Tropical Medicine and Public Health. 2019;50(4):688-702.
37. Borges R, Fonseca J, Gomes C, Johnson WE, O’Brien SJ, Zhang G, et al. Avian binocularity and adaptation to nocturnal environments: Genomic insights from a highly derived visual phenotype. Genome biology and evolution. 2019;11(8):2244-55.
38. Botto-Menezes CHA, Neto AM, Calvet GA, Kara EO, Lacerda MVG, Castilho MDC, et al. Zika virus in rectal swab samples. Emerging infectious diseases. 2019;25(5):951-4.
39. Boutte AM, Thangavelu B, LaValle CR, Nemes J, Gilsdorf J, Shear DA, et al. Brain-related proteins as serum biomarkers of acute, subconcussive blast overpressure exposure: A cohort study of military personnel. PloS one. 2019;14(8):e0221036.
40. Brennan AT, Maskew M, Larson BA, Tsikhutsu I, Bii M, Vezi L, et al. Who is seeking antiretroviral treatment for HIV now? Characteristics of patients presenting in Kenya and South Africa in 2017-2018. Journal of the International AIDS Society. 2019;22(9):e25358.
41. Britt TW, Wright KM, Sipos ML, McGurk D. Testing the effects of using a behavioral health provider to deliver a routine post-deployment assessment for soldiers returning from combat. Psychological services. 2019;16(4):651-6.
42. Burns RJL, Douangngeun B, Theppangna W, Mukaka M, Wegner MD, Windsor PA, et al. Peste des petits ruminants (PPR) virus serological surveillance in goats in Lao PDR: Issues for disease eradication in a low-resource disease-free setting. Transboundary and emerging diseases. 2019;66(2):939-47.
43. Campbell LP, Reuman DC, Lutomiah J, Peterson AT, Linthicum KJ, Britch SC, et al. Predicting abundances of Aedes mcintoshi, a primary Rift Valley fever virus mosquito vector. PloS one. 2019;14(12):e0226617.
44. Capaldi VF, Balkin TJ, Mysliwiec V. Optimizing sleep in the military: Challenges and opportunities. Chest. 2019;155(1):215-26.
45. Caridha D, Hickman M, Xie L, Ngundam F, Milner E, Schenk A, et al. Updating the modified Thompson test by using whole-body bioluminescence imaging to replace traditional efficacy testing in experimental models of murine malaria. Malaria journal. 2019;18(1):38.
46. Caridha D, Vesely B, van Bocxlaer K, Arana B, Mowbray CE, Rafati S, et al. Route map for the discovery and pre-clinical development of new drugs and treatments for cutaneous leishmaniasis. International journal for parasitology Drugs and drug resistance. 2019;11:106-17.

47. Cawlfield A, Genito CJ, Beck Z, Bergmann-Leitner ES, Bitzer AA, Soto K, et al. Safety, toxicity and immunogenicity of a malaria vaccine based on the circumsporozoite protein (FMP013) with the adjuvant army liposome formulation containing QS21 (ALFQ). Vaccine. 2019;37(29):3793-803.
48. Chadalavada D, Samineni S. Proposed procedure prompts more questions. Lab animal. 2019;48(4):98.
49. Chaitaveep N, Utachee P, Tabprasit S, Chuenchitra T, Kameoka M. Comparison of antibody-dependent cellular cytotoxicity activity elicited in recent and chronic HIV-1-infected Thai individuals. Southeast Asian Journal of Tropical Medicine and Public Health. 2019;50(4):651-62.
50. Chan P, Ananworanich J. Perspective on potential impact of HIV central nervous system latency on eradication. AIDS (London, England). 2019;33 Suppl. 2:S123-33.
51. Chan P, Dumrongpisutikul N, Subra C, Colby DJ, Kroon E, Fletcher J, et al. Neurosyphilis during acute HIV infection: A CNS immunologic and virologic characterization. Journal of acquired immune deficiency syndromes (1999). 2019;82(2):e34-e7.
52. Cheng YS, Sun W, Xu M, Shen M, Khraiwesh M, Sciotti RJ, et al. Repurposing screen identifies unconventional drugs with activity against multidrug resistant Acinetobacter baumannii. Frontiers in Cellular and Infection Microbiology. 2019;8:438.
53. Chua ACY, Ananthanarayanan A, Ong JJY, Wong JY, Yip A, Singh NH, et al. Hepatic spheroids used as an in vitro model to study malaria relapse. Biomaterials. 2019;216:119221.
54. Chung The H, Boinett C, Pham Thanh D, Jenkins C, Weill FX, Howden BP, et al. Dissecting the molecular evolution of fluoroquinolone-resistant Shigella sonnei. Nature communications. 2019;10(1):4828.
55. Clements TL, Rossi CA, Irish AK, Kibuuka H, Eller LA, Robb ML, et al. Chikungunya and o'nyong-nyong viruses in Uganda: Implications for diagnostics. Open Forum Infectious Diseases. 2019;6(3):FZ1.
56. Coates MM, Kamanda M, Kintu A, Arikpo I, Chauque A, Mengesha MM, et al. A comparison of all-cause and cause-specific mortality by household socioeconomic status across seven INDEPTH network health and demographic surveillance systems in sub-Saharan Africa. Global health action. 2019;12(1):1608013.
57. Conway MA, O'Shea B, Redford L, Pogge G, Klein RA, Ratliff KA. Can carelessness be captured? Assessing careless responding in attitudes toward novel stimuli. Social Cognition. 2019;37(5):468-98.
58. Crawford MA, Margulieux KR, Singh A, Nakamoto RK, Hughes MA. Mechanistic insights and therapeutic opportunities of antimicrobial chemokines. Seminars in cell & developmental biology. 2019;88:119-28.
59. Crowell TA, Baral SD, Schwartz S, Nowak RG, Kokogho A, Adebajo S, et al. Time to change the paradigm: limited condom and lubricant use among Nigerian men who have sex with men and transgender women despite availability and counseling. Annals of epidemiology. 2019;31:11-9.e3.
60. Crowell TA, Colby DJ, Pinyakorn S, Sacdalan C, Pagliuzza A, Intasan J, et al. Safety and efficacy of VRC01 broadly neutralising antibodies in adults with acutely treated HIV (RV397): a phase 2, randomised, double-blind, placebo-controlled trial. The lancet HIV. 2019;6(5):e297-e306.
61. Crowley NA, Dao NC, Magee SN, Bourcier AJ, Lowery-Gionta EG. Animal models of alcohol use disorder and the brain: From casual drinking to dependence. Translational Issues in Psychological Science. 2019;5(3):222-42.
62. Curley JM, Warner CH. Maximizing the division psychiatrist's garrison prevention role to meet the U.S. Army's 21st century readiness expectations. Military medicine. 2019;184(5-6):e183-91.
63. Dahal P, Simpson JA, Abdulla S, Achan J, Adam I, Agarwal A, et al. Competing risk events in antimalarial drug trials in uncomplicated Plasmodium falciparum malaria: a WorldWide Antimalarial Resistance Network individual participant data meta-analysis. Malaria journal. 2019;18(1):225.
64. Dayani Y, Stierwalt J, White A, Chen Y, Arnaud F, Jefferson MA, et al. Hypobaria during aeromedical evacuation exacerbates histopathological injury and modifies inflammatory response in rats exposed to blast overpressure injury. The journal of trauma and acute care surgery. 2019;87(1):205-13.
65. Deleage C, Schuetz A, Alvord WG, Johnston L, Hao XP, Morcock DR, et al. Impact of early cART in the gut during acute HIV infection. JCI insight. 2016;1(10).
66. Demiral SB, Tomasi D, Sarlls J, Lee H, Wiers CE, Zehra A, et al. Apparent diffusion coefficient changes in human brain during sleep - Does it inform on the existence of a glymphatic system? NeuroImage. 2019;185:263-73.
67. Demiral SB, Tomasi D, Wiers CE, Manza P, Shokri-Kojori E, Studentsova Y, et al. Methylphenidate's effects on thalamic metabolism and functional connectivity in cannabis abusers and healthy controls. Neuropsychopharmacology : official publication of the American College of Neuropsychopharmacology. 2019;44(8):1389-97.
68. Deng-Bryant Y, Leung LY, Madathil S, Flerlage J, Yang F, Yang W, et al. Chronic cognitive deficits and associated histopathology following closed-head concussive injury in rats. Front Neurol. 2019;10:699.
69. Dettweiler M, Lyles JT, Nelson K, Dale B, Reddinger RM, Zurawski DV, et al. American Civil War plant medicines inhibit growth, biofilm formation, and quorum sensing by multidrug-resistant bacteria. Scientific reports. 2019;9(1):7692.
70. Devine JK, Burke TM, Skeiky L, Choynowski JJ, Quartana PJ, Balkin TJ, et al. Objective changes in activity levels following sleep extension as measured by wrist actigraphy. Sleep medicine. 2019;60:173-7.
71. Dharmarajan G, Walker KD, Lehmann T. Variation in tolerance to parasites affects vectorial capacity of natural Asian tiger mosquito populations. Current biology : CB. 2019;29(22):3946-52.

72. Dincer E, Hacioglu S, Kar S, Emanet N, Brinkmann A, Nitsche A, et al. Survey and characterization of Jingmen tick virus variants. Viruses. 2019;11(11).
73. Dobano C, Santano R, Vidal M, Jimenez A, Jairoce C, Ubillos I, et al. Differential patterns of IgG subclass responses to Plasmodium falciparum antigens in relation to malaria protection and RTS,S vaccination. Frontiers in immunology. 2019;10:439.
74. Dobano C, Sanz H, Sorgho H, Dosoo D, Mpina M, Ubillos I, et al. Concentration and avidity of antibodies to different circumsporozoite epitopes correlate with RTS,S/AS01E malaria vaccine efficacy. Nature communications. 2019;10(1):2174.
75. Dobano C, Ubillos I, Jairoce C, Gyan B, Vidal M, Jimenez A, et al. RTS,S/AS01E immunization increases antibody responses to vaccine-unrelated Plasmodium falciparum antigens associated with protection against clinical malaria in African children: a case-control study. BMC medicine. 2019;17(1):157.
76. Dodean RA, Kancharla P, Li Y, Melendez V, Read L, Bane CE, et al. Discovery and structural optimization of acridones as broad-spectrum antimalarials. Journal of medicinal chemistry. 2019;62(7):3475-502.
77. Dretsch MN, Rangaprakash D, Katz JS, Daniel TA, Goodman AM, Denney TS, et al. Strength and temporal variance of the default mode network to investigate chronic mild traumatic brain injury in service members with psychological trauma. Journal of experimental neuroscience. 2019;13:1179069519833966.
78. Eckels KH, De La Barrera RA, Putnak JR. Immunological assays used to support efficacy of Zika virus vaccines. Tropical medicine and infectious disease. 2019;4(3).
79. Edgar RJ, van Hensbergen VP, Ruda A, Turner AG, Deng P, Le Breton Y, et al. Discovery of glycerol phosphate modification on streptococcal rhamnose polysaccharides. Nature chemical biology. 2019;15(5):463-71.
80. Egizi AM, Robbins RG, Beati L, Navas S, Evans CR, Occi JL, et al. A pictorial key to differentiate the recently detected exotic Haemaphysalis longicornis Neumann, 1901 (Acari, Ixodidae) from native congeners in North America. Zookeys. 2019(818):117-28.
81. Ehrenberg PK, Shangguan S, Issac B, Alter G, Geretz A, Izumi T, et al. A vaccine-induced gene expression signature correlates with protection against SIV and HIV in multiple trials. Science translational medicine. 2019;11(507).
82. Elbers JP, Rogers MF, Perelman PL, Proskuryakova AA, Serdyukova NA, Johnson WE, et al. Improving Illumina assemblies with Hi-C and long reads: An example with the North African dromedary. Molecular ecology resources. 2019;19(4):1015-26.
83. Elliott T, Sanders EJ, Doherty M, Ndung'u T, Cohen M, Patel P, et al. Challenges of HIV diagnosis and management in the context of pre-exposure prophylaxis (PrEP), post-exposure prophylaxis (PEP), test and start and acute HIV infection: a scoping review. Journal of the International AIDS Society. 2019;22(12):e25419.
84. Emanet N, Kar S, Dincer E, Brinkmann A, Hacioglu S, Farzani TA, et al. Novel tick phlebovirus genotypes lacking evidence for vertebrate infections in Anatolia and Thrace, Turkey. Viruses. 2019;11(8).
85. Erisoz Kasap O, Linton YM, Karakus M, Ozbel Y, Alten B. Revision of the species composition and distribution of Turkish sand flies using DNA barcodes. Parasites & vectors. 2019;12(1):410.
86. Esber A, Polyak C, Kiweewa F, Maswai J, Owuoth J, Maganga L, et al. Persistent low-level viremia predicts subsequent virologic failure: Is it time to change the third 90? Clinical infectious diseases : an official publication of the Infectious Diseases Society of America. 2019;69(5):805-12.
87. Farre M, Kim J, Proskuryakova AA, Zhang Y, Kulemzina AI, Li Q, et al. Evolution of gene regulation in ruminants differs between evolutionary breakpoint regions and homologous synteny blocks. Genome research. 2019;29(4):576-89.
88. Fleishman E, Brown H. Use of macroecology to integrate social justice and conservation. Global Ecol Biogeogr. 2019;28(10):1512-8.
89. Flynn AF, Joyce MG, Taylor RT, Bennuru S, Lindrose AR, Sterling SL, et al. Intestinal UDP-glucuronosyltransferase as a potential target for the treatment and prevention of lymphatic filariasis. PLoS neglected tropical diseases. 2019;13(9):e0007687.
90. Fogarty AE, Guay CS, Simoneau G, Colorado BS, Segal GR, Werner JK, Jr., et al. Head motion predicts transient loss of consciousness in human head trauma: A case-control study of mixed martial artists. American journal of physical medicine & rehabilitation. 2019;98(10):859-65.
91. Folgueira A, Simonelli G, Plano S, Tortello C, Cuiuli JM, Blanchard A, et al. Sleep, napping and alertness during an overwintering mission at Belgrano II Argentine Antarctic station. Scientific reports. 2019;9(1):10875.
92. Forbes D, Pedlar D, Adler AB, Bennett C, Bryant R, Busuttil W, et al. Treatment of military-related post-traumatic stress disorder: challenges, innovations, and the way forward. International review of psychiatry (Abingdon, England). 2019;31(1):95-110.
93. Foster CA, D'Lauro C, Johnson BR. A social dilemma model of information self-disclosure, applied to the concussion domain. Journal of Concussion. 2019;3:1-11.
94. Foster CA, D'Lauro C, Johnson BR. Pilots and athletes: Different concerns, similar concussion non-disclosure. PloS one. 2019;14(5):e0215030.
95. Fourati S, Ribeiro SP, Blasco Tavares Pereira Lopes F, Talla A, Lefebvre F, Cameron M, et al. Integrated systems approach defines the antiviral pathways conferring protection by the RV144 HIV vaccine. Nature communications. 2019;10(1):863.
96. Galac MR, Hoang TM, Ong AC, Hinkle M, O'Gara JP, Fey PD. Complete genome sequence of Staphylococcus epidermidis CSF41498. Microbiology resource announcements. 2019;8(2).

97. Galvin JW, Thompson JC, Thompson AM, Parada SA, Eichinger JK, Dickens JF, et al. A guide to understanding reimbursement and value-based care in the military health system. Military medicine. 2019;184(3-4):E205-E10.

98. Garshick E, Abraham JH, Baird CP, Ciminera P, Downey GP, Falvo MJ, et al. Respiratory health after military service in southwest Asia and Afghanistan. An official American Thoracic Society workshop report. Annals of the American Thoracic Society. 2019;16(8):e1-16.

99. Geraghty DE, Thorball CW, Fellay J, Thomas R. Effect of Fc receptor genetic diversity on HIV-1 disease pathogenesis. Frontiers in Immunology. 2019;10:Article 970.

100. Ghansah A, Kamau E, Amambua-Ngwa A, Ishengoma DS, Maiga-Ascofare O, Amenga-Etego L, et al. Targeted next generation sequencing for malaria research in Africa: Current status and outlook. Malaria journal. 2019;18(1):324.

101. Goh OQ, Colby DJ, Pinyakorn S, Sacdalan C, Kroon E, Chan P, et al. Switch to dolutegravir is well tolerated in Thais with HIV infection. Journal of the International AIDS Society. 2019;22(7):e25324.

102. Gray GE, Huang Y, Grunenberg N, Laher F, Roux S, Andersen-Nissen E, et al. Immune correlates of the Thai RV144 HIV vaccine regimen in South Africa. Science translational medicine. 2019;11(510).

103. Gresty K, Anderson K, Pasay C, Waters NC, Cheng Q. Polymorphisms in Plasmodium falciparum Kelch 13 and P. vivax Kelch 12 genes in parasites collected from three South Pacific countries prior to extensive exposure to artemisinin combination therapies. Antimicrobial agents and chemotherapy. 2019;63(7).

104. Guan M, Hall JS, Zhang X, Dusek RJ, Olivier AK, Liu L, et al. Aerosol transmission of gull-origin Iceland subtype H10N7 influenza A virus in ferrets. Journal of virology. 2019;93(13).

105. Guendel I, Ekpo LL, Hinkle MK, Harrison CJ, Blaney DD, Gee JE, et al. Melioidosis after Hurricanes Irma and Maria, St. Thomas/St. John District, US Virgin Islands, October 2017. Emerging infectious diseases. 2019;25(10):1952-5.

106. Guerra Mendoza Y, Garric E, Leach A, Lievens M, Ofori-Anyinam O, Pircon JY, et al. Safety profile of the RTS,S/AS01 malaria vaccine in infants and children: additional data from a phase III randomized controlled trial in sub-Saharan Africa. Human vaccines & immunotherapeutics. 2019;15(10):2386-98.

107. Guzman-Cornejo C, Herrera-Mares A, Robbins RG, Rebollo-Hernandez A. The soft ticks (Parasitiformes: Ixodida: Argasidae) of Mexico: species, hosts, and geographical distribution. Zootaxa. 2019;4623(3):485-525.

108. Hall CE, Hagan LM, Bergmann-Leitner E, Tosh DM, Bennett JW, Regules JA, et al. Mosquito bite-induced controlled human malaria infection with Plasmodium vivax or P. falciparum generates immune responses to homologous and heterologous preerythrocytic and erythrocytic antigens. Infection and immunity. 2019;87(3).

109. Haque MA, Platts-Mills JA, Mduma E, Bodhidatta L, Bessong P, Shakoor S, et al. Determinants of Campylobacter infection and association with growth and enteric inflammation in children under 2 years of age in low-resource settings. Scientific reports. 2019;9(1):17124.

110. Harbertson J, De Vera K, Scott PT, Li Y, Shaffer RA, Michael NL, et al. Longitudinal survey of condom use across a US Navy and Marine Corps shipboard deployment. BMJ open. 2019;9(6):e028151.

111. Harbertson J, Scott PT, Lemus H, Michael NL, Hale BR. Cross-Sectional Study of Sexual Behavior, Alcohol Use, and Mental Health Conditions Associated With Sexually Transmitted Infections Among Deploying Shipboard US Military Personnel. Military medicine. 2019;184(11-12):e693-700.

112. Hellmuth J, Slike BM, Sacdalan C, Best J, Kroon E, Phanuphak N, et al. Very early initiation of antiretroviral therapy during acute HIV infection is associated with normalized levels of immune activation markers in cerebrospinal fluid but not in plasma. The Journal of infectious diseases. 2019;220(12):1885-91.

113. Henderson GE, Waltz M, Meagher K, Cadigan RJ, Jupimai T, Isaacson S, et al. Going off antiretroviral treatment in a closely monitored HIV “cure” trial: longitudinal assessments of acutely diagnosed trial participants and decliners. Journal of the International AIDS Society. 2019;22(3):e25260.

114. Hessell AJ, Powell R, Jiang X, Luo C, Weiss S, Dussupt V, et al. Multimeric epitope-scaffold HIV vaccines target V1V2 and differentially tune polyfunctional antibody responses. Cell reports. 2019;28(4):877-95.e6.

115. Heyburn L, Abutarboush R, Goodrich S, Urioste R, Batuure A, Statz J, et al. Repeated low-level blast overpressure leads to endovascular disruption and alterations in TDP-43 and Piezo2 in a rat model of blast TBI. Frontiers in Neurology. 2019;10:766.

116. Heyburn L, Sajja V, Long JB. The role of TDP-43 in military-relevant TBI and chronic neurodegeneration. Front Neurol. 2019;10:680.

117. Hoang TM, Zhou C, Lindgren JK, Galac MR, Corey B, Endres JE, et al. Transcriptional regulation of icaADBC by both IcaR and TcaR in Staphylococcus epidermidis. Journal of bacteriology. 2019;201(6).

118. Hoge CW. Suicide reduction and research efforts in service members and veterans-sobering realities. JAMA psychiatry. 2019;76(5):464-6.

119. Horwood PF, Karlsson EA, Horm SV, Ly S, Heng S, Chin S, et al. Circulation and characterization of seasonal influenza viruses in Cambodia, 2012-2015. Influenza and other respiratory viruses. 2019;13(5):465-76.

120. Hsu DC, Mellors JW. Longitudinal changes in HIV DNA in HIV controllers: what do they mean? Journal of the International AIDS Society. 2019;22(2):e25254.

121. Hsu DC, Silsorn D, Inthawong D, Kuncharin Y, Sopanaporn J, Im-Erbsin R, et al. Impact of analytical treatment interruption on the central nervous system in a simian-HIV model. AIDS (London, England). 2019;33 Suppl. 2:S189-96.

122. Huang H, Li Y, Liang H, Wu CO. Decomposition feature selection with applications in detecting correlated biomarkers of bipolar disorders. Statistics in medicine. 2019;38(23):4574-82.

123. Huguet M, Payne JD, Kim SY, Alger SE. Overnight sleep benefits both neutral and negative direct associative and relational memory. Cognitive, affective & behavioral neuroscience. 2019;19(6):1391-403.

124. Inusa BPD, Colombatti R, Rees DC, Heeney MM, Hoppe CC, Ogutu B, et al. Geographic differences in phenotype and treatment of children with sickle cell anemia from the multinational DOVE study. Journal of clinical medicine. 2019;8(11).

125. Jagodzinski LL, Manak MM, Hack HR, Liu Y, Malia JA, Freeman J, et al. Impact of early antiretroviral therapy on detection of cell-associated HIV-1 nucleic acid in blood by the Roche Cobas TaqMan test. Journal of clinical microbiology. 2019;57(5).

126. Jakharia KK, Ilaiwy G, Moose SS, Waga M, Appalla L, McAlduff JD, et al. Use of whole-genome sequencing to guide a Clostridioides difficile diagnostic stewardship program. Infection control and hospital epidemiology. 2019;40(7):804-6.

127. Jasmin K, Gotts SJ, Xu Y, Liu S, Riddell CD, Ingeholm JE, et al. Overt social interaction and resting state in young adult males with autism: core and contextual neural features. Brain : a journal of neurology. 2019;142(3):808-22.

128. Julg B, Dee L, Ananworanich J, Barouch DH, Bar K, Caskey M, et al. Recommendations for analytical antiretroviral treatment interruptions in HIV research trials-report of a consensus meeting. The lancet HIV. 2019;6(4):e259-e68.

129. Juma DW, Muiruri P, Yuhas K, John-Stewart G, Ottichilo R, Waitumbi J, et al. The prevalence and antifolate drug resistance profiles of Plasmodium falciparum in study participants randomized to discontinue or continue cotrimoxazole prophylaxis. PLoS neglected tropical diseases. 2019;13(3):e0007223.

130. Kaminski RW, Pasetti MF, Aguilar AO, Clarkson KA, Rijpkema S, Bourgeois AL, et al. Consensus Report on Shigella Controlled Human Infection Model: Immunological Assays. Clinical infectious diseases : an official publication of the Infectious Diseases Society of America. 2019;69(Suppl. 8):S596-601.

131. Karch CP, Bai H, Torres OB, Tucker CA, Michael NL, Matyas GR, et al. Design and characterization of a self-assembling protein nanoparticle displaying HIV-1 Env V1V2 loop in a native-like trimeric conformation as vaccine antigen. Nanomedicine : nanotechnology, biology, and medicine. 2019;16:206-16.

132. Karch CP, Burkhard P, Matyas GR, Beck Z. Production of E. coli-expressed Self-Assembling Protein Nanoparticles for Vaccines Requiring Trimeric Epitope Presentation. Journal of visualized experiments : JoVE. 2019(150).

133. Karch CP, Matyas GR, Burkhard P, Beck Z. Glycosylation of the HIV-1 Env V1V2 loop to form a native-like structure may not be essential with a nanoparticle vaccine. Future Virol. 2019;14(2):51-4.

134. Kassem HA, Zayed AB, Watany N, Fawaz EY, Hoel DF, Zollner G. Residual efficacy of insecticides sprayed on different types of surfaces against leishmaniasis and filariasis vectors in Egypt. Journal of medical entomology. 2019;56(3):796-802.

135. Kassi AAY, Mahavadi AK, Clavijo A, Caliz D, Lee SW, Ahmed AI, et al. Enduring neuroprotective effect of subacute neural stem cell transplantation after penetrating TBI. Front Neurol. 2019;9:27.

136. Kateete DP, Asiimwe BB, Mayanja R, Mujuni B, Bwanga F, Najjuka CF, et al. Nasopharyngeal carriage, spa types and antibiotic susceptibility profiles of Staphylococcus aureus from healthy children less than 5 years in Eastern Uganda. BMC infectious diseases. 2019;19(1):1023.

137. Kateete DP, Bwanga F, Seni J, Mayanja R, Kigozi E, Mujuni B, et al. CA-MRSA and HA-MRSA coexist in community and hospital settings in Uganda. Antimicrobial resistance and infection control. 2019;8:94.

138. Kerr SJ, Puthanakit T, Malee KM, Thongpibul K, Ly PS, Sophonphan J, et al. Increased risk of executive function and emotional behavioral problems among virologically well-controlled perinatally HIV-infected adolescents in Thailand and Cambodia. Journal of acquired immune deficiency syndromes (1999). 2019;82(3):297-304.

139. Khan I, Maldonado E, Silva L, Almeida D, Johnson WE, O’Brien SJ, et al. The vertebrate TLR supergene family evolved dynamically by gene gain/loss and positive selection revealing a host-pathogen arms race in birds. Diversity. 2019;11(8).

140. Kijak GH, Sanders-Buell E, Pham P, Harbolick EA, Oropeza C, O’Sullivan AM, et al. Next-generation sequencing of HIV-1 single genome amplicons. Biomolecular detection and quantification. 2019;17:100080.

141. Kivata MW, Mbuchi M, Eyase FL, Bulimo WD, Kyanya CK, Oundo V, et al. gyrA and parC mutations in fluoroquinolone-resistant Neisseria gonorrhoeae isolates from Kenya. BMC microbiology. 2019;19(1):76.

142. Kiweewa F, Esber A, Musingye E, Reed D, Crowell TA, Cham F, et al. HIV virologic failure and its predictors among HIV-infected adults on antiretroviral therapy in the African Cohort Study. PloS one. 2019;14(2):e0211344.

143. Kobres PY, Chretien JP, Johansson MA, Morgan JJ, Whung PY, Mukundan H, et al. A systematic review and evaluation of Zika virus forecasting and prediction research during a public health emergency of international concern. PLoS neglected tropical diseases. 2019;13(10):e0007451.

144. Koepfli KP, Tamazian G, Wildt D, Dobrynin P, Kim C, Frandsen PB, et al. Whole genome sequencing and re-sequencing of the sable antelope (Hippotragus niger): A resource for monitoring diversity in ex situ and in situ populations. G3 (Bethesda, Md). 2019;9(6):1785-93.

145. Korencak M, Byrne M, Richter E, Schultz BT, Juszczak P, Ake JA, et al. Effect of HIV infection and antiretroviral therapy on immune cellular functions. JCI insight. 2019;4(12).

146. Kyany'a C, Eyase F, Odundo E, Kipkirui E, Kipkemoi N, Kirera R, et al. First report of Entamoeba moshkovskii in human stool samples from symptomatic and asymptomatic participants in Kenya. Tropical diseases, travel medicine and vaccines. 2019;5:23.

147. Kyany'a C, Nyasinga J, Matano D, Oundo V, Wacira S, Sang W, et al. Phenotypic and genotypic characterization of clinical Staphylococcus aureus isolates from Kenya. BMC microbiology. 2019;19(1):245.

148. Labbe GM, Miura K, Silk SE, Gu W, Moon JE, Jin J, et al. Harmonization study between three laboratories for expression of malaria vaccine clinical trial IgG antibody ELISA data in microg/mL. Malaria journal. 2019;18(1):300.

149. Lakhal-Naouar I, Koles N, Rao M, Morrison EB, Childs JM, Alving CR, et al. Transcutaneous immunization using SLA or rLACK skews the immune response towards a Th1 profile but fails to protect BALB/c mice against a Leishmania major challenge. Vaccine. 2019;37(3):516-23.

150. Lam-Phua SG, Yeo H, Lee RM, Chong CS, Png AB, Foo SY, et al. Mosquitoes (Diptera: Culicidae) of Singapore: Updated checklist and new records. Journal of medical entomology. 2019;56(1):103-19.

151. Lang JWB, Bliese PD, Adler AB. Opening the black box: A multilevel framework for studying group processes. Advances in Methods and Practices in Psychological Science. 2019;2(3):271-87.

152. Larocca RA, Mendes EA, Abbink P, Peterson RL, Martinot AJ, Iampietro MJ, et al. Adenovirus vector-based vaccines confer maternal-fetal protection against Zika virus challenge in pregnant IFN-alphabetaR(-/-) mice. Cell host & microbe. 2019;26(5):591-600.e4.

153. Larson BA, Halim N, Tsikhutsu I, Bii M, Coakley P, Rockers PC. A tool for estimating antiretroviral medication coverage for HIV-infected women during pregnancy (PMTCT-ACT). Global health research and policy. 2019;4:29.

154. LaValle CR, Carr WS, Egnoto MJ, Misistia AC, Salib JE, Ramos AN, et al. Neurocognitive performance deficits related to immediate and acute blast overpressure exposure. Front Neurol. 2019;10:949.

155. Le L, Tran LK, Le-Ha TD, Tran BP, Le-Vo HN, Nguyen YN, et al. Coexistence Of Plasmid-Mediated mcr-1 And bla NDM-4 Genes In A Klebsiella pneumoniae Clinical Strain In Vietnam. Infection and drug resistance. 2019;12:3703-7.

156. Lee H, Mizrahi MA, Hartings JA, Sharma S, Pahren L, Ngwenya LB, et al. Continuous electroencephalography after moderate to severe traumatic brain injury. Critical care medicine. 2019;47(4):574-82.

157. Lee KH, Petruncio G, Shim A, Burdick M, Zhang Z, Shim YM, et al. Effect of Modifier Structure on the Activation of Leukotriene A4 Hydrolase Aminopeptidase Activity. Journal of medicinal chemistry. 2019;62(23):10605-16.

158. Leeds DD, D'Lauro C, Johnson BR. Predictive power of head impact intensity measures for recognition memory performance. Military medicine. 2019;184(Suppl. 1):206-17.

159. Letizia A, Eller MA, Polyak C, Eller LA, Creegan M, Dawson P, et al. Biomarkers of inflammation correlate with clinical scoring indices in human immunodeficiency virus-infected Kenyans. The Journal of infectious diseases. 2019;219(2):284-94.

160. Le-Vo HN, Tran PT, Le L, Matsumoto Y, Motooka D, Nakamura S, et al. Complex class 1 integron in a clinical Escherichia coli strain from Vietnam carrying both mcr-1 and bla NDM-1. Frontiers in microbiology. 2019;10:2472.

161. Lewitus E, Rolland M. A non-parametric analytic framework for within-host viral phylogenies and a test for HIV-1 founder multiplicity. Virus evolution. 2019;5(2):vez044.

162. Li L, Collins ND, Widen SG, Davis EH, Kaiser JA, White MM, et al. Attenuation of zika virus by passage in human HeLa cells. Vaccines. 2019;7(3).

163. Lima-Cordon RA, Monroy MC, Stevens L, Rodas A, Rodas GA, Dorn PL, et al. Description of Triatomahuehuetenanguensis sp. n., a potential Chagas disease vector (Hemiptera, Reduviidae, Triatominae). Zookeys. 2019(820):51-70.

164. Loaiza JR, Rovira JR, Sanjur OI, Zepeda JA, Pecor JE, Foley DH, et al. Forest disturbance and vector transmitted diseases in the lowland tropical rainforest of central Panama. Tropical medicine & international health : TM & IH. 2019;24(7):849-61.

165. Lombardini E, Haetrakul T, Kuit SH, Chansue N. Gastric braunina cordiformis and a review of helminth parasitism in the finless porpoise (Neophocaena phocaenoides). Braz J Vet Pathology. 2019;12(1):24-6.

166. Lopez AA, Adler AB, Cabrera OA, Thomas JL. Validation of the WRAIR Leadership Scale. Mil behav Health. 2019;7(2):125-34.

167. Loredo JS, Weng J, Ramos AR, Sotres-Alvarez D, Simonelli G, Talavera GA, et al. Sleep patterns and obesity: Hispanic community health study/study of Latinos sueno ancillar study. Chest. 2019;156(2):348-56.

168. Lowery-Gionta EG, May MD, Taylor RM, Bergman EM, Etuma MT, Jeong IH, et al. Modeling trauma to develop treatments for posttraumatic stress. Translational Issues in Psychological Science. 2019;5(3):243-75.

169. Lumley LA, Rossetti F, de Araujo Furtado M, Marrero-Rosado B, Schultz CR, Schultz MK, et al. Dataset of EEG power integral, spontaneous recurrent seizure and behavioral responses following combination drug therapy in soman-exposed rats. Data Brief. 2019;27:104629.

170. Lurchachaiwong W, Ruksasiri S, Wassanarungroj P, Serichantalergs O, Bodhidatta L, Crawford J, et al. Determination of azithromycin heteroresistant Campylobacter jejuni in traveler's diarrhea. Gut pathogens. 2019;11:19.

171. Macicame I, Bhatt N, Matavele Chissumba R, Eller LA, Viegas E, Araujo K, et al. HIV prevalence and risk behavior among male and female adults screened for enrolment into a vaccine preparedness study in Maputo, Mozambique. PloS one. 2019;14(9):e0221682.

172. Maciel M, Jr., Bauer D, Baudier RL, Bitoun J, Clements JD, Poole ST, et al. Intradermal or sublingual delivery and heat-labile enterotoxin proteins shape immunologic responses to a CFA/I fimbria-derived subunit antigen vaccine against enterotoxigenic Escherichia coli. Infection and immunity. 2019;87(11).

173. Maciel M, Jr., Smith M, Poole ST, Laird RM, Rollenhagen JE, Kaminski RW, et al. Evaluation of the reactogenicity, adjuvanticity and antigenicity of LT(R192G) and LT(R192G/L211A) by intradermal immunization in mice. PloS one. 2019;14(11):e0224073.

174. Malee KM, Kerr S, Paul R, Puthanakit T, Thongpibul K, Kosalaraksa P, et al. Emotional and behavioral resilience among children with perinatally acquired HIV in Thailand and Cambodia. AIDS (London, England). 2019;33(Suppl. 1):S17-27.

175. Maljkovic Berry I, Eyase F, Pollett S, Konongoi SL, Joyce MG, Figueroa K, et al. Global outbreaks and origins of a chikungunya virus variant carrying mutations which may increase fitness for Aedes aegypti: Revelations from the 2016 Mandera, Kenya outbreak. The American journal of tropical medicine and hygiene. 2019;100(5):1249-57.

176. Manak MM, Jagodzinski LL, Shutt A, Malia JA, Leos M, Ouellette J, et al. Decreased seroreactivity in individuals initiating antiretroviral therapy during acute HIV infection. Journal of clinical microbiology. 2019;57(10).

177. Manasatienkij W, Chinnawirotpaisan P, Kittichotirat W, Macareo LR, Ellison DW, Cheevadhanarak S, et al. Genetic characterization of influenza A(H3N2) viruses from vaccinated and unvaccinated children during Thailand 2013 and 2014 influenza seasons. Southeast Asian Journal of Tropical Medicine and Public Health. 2019;50(1):101-19.

178. Mantua J, Bessey A, Sowden WJ, Chabuz R, Brager AJ, Capaldi VF, et al. A review of environmental barriers to obtaining adequate sleep in the military operational context. Military medicine. 2019;184(7-8):e259-e66.

179. Mantua J, Ready RE. Emotion habituation is accelerated in chronic mild traumatic brain injury. Brain injury. 2019;33(11):1467-75.

180. Mantua J, Simonelli G. Sleep duration and cognition: is there an ideal amount? Sleep. 2019;42(3):zsz010.

181. Mantua J, Skeiky L, Prindle N, Trach S, Doty TJ, Balkin TJ, et al. Sleep extension reduces fatigue in healthy, normally-sleeping young adults. Sleep science (Sao Paulo, Brazil). 2019;12(1):21-7.

182. Mao JJ, Norval G, Robbins RG, Wong ST. An instance of Boiga dendrophila dendrophila (Boie, 1827) (Reptilia: Colubridae) being parasitized by Amblyomma helvolum Koch, 1844 (Acari: Ixodidae), with comments about the attachment sites of this tick species. Acarologia. 2019;59(1):115-9.

183. Martin ML, Bitzer AA, Schrader A, Bergmann-Leitner ES, Soto K, Zou X, et al. Comparison of immunogenicity and safety outcomes of a malaria vaccine FMP013/ALFQ in rhesus macaques (Macaca mulatta) of Indian and Chinese origin. Malaria journal. 2019;18(1):377.

184. Masel J, McCracken MK, Gleeson T, Morrison B, Rutherford G, Imrie A, et al. Does prior dengue virus exposure worsen clinical outcomes of Zika virus infection? A systematic review, pooled analysis and lessons learned. PLoS neglected tropical diseases. 2019;13(1):e0007060.

185. Massanella M, Bakeman W, Sithinamsuwan P, Fletcher JLK, Chomchey N, Tipsuk S, et al. Infrequent HIV Infection of Circulating Monocytes during Antiretroviral Therapy. Journal of virology. 2019;94(1).

186. Matowo NS, Abbasi S, Munhenga G, Tanner M, Mapua SA, Oullo D, et al. Fine-scale spatial and temporal variations in insecticide resistance in Culex pipiens complex mosquitoes in rural south-eastern Tanzania. Parasites & vectors. 2019;12(1):413.

187. Mattiuzzo G, Knezevic I, Hassall M, Ashall J, Myhill S, Faulkner V, et al. Harmonization of Zika neutralization assays by using the WHO International Standard for anti-Zika virus antibody. NPJ vaccines. 2019;4:42.

188. McCormick BJJ, Murray-Kolb LE, Lee GO, Schulze KJ, Ross AC, Bauck A, et al. Intestinal permeability and inflammation mediate the association between nutrient density of complementary foods and biochemical measures of micronutrient status in young children: results from the MAL-ED study. The American journal of clinical nutrition. 2019;110(4):1015-25.

189. McCormick BJJ, Richard SA, Caulfield LE, Pendergast LL, Seidman JC, Koshy B, et al. Early life child micronutrient status, maternal reasoning, and a nurturing household environment have persistent influences on child cognitive development at age 5 years: Results from MAL-ED. The Journal of nutrition. 2019;149(8):1460-9.

190. McCutchen EL, Galac M, Kapsak C, Hinrichs SH, Iwen PC, Abdalhamid B. Genome sequence of a Salmonella enterica subsp. enterica serovar Corvallis strain isolated from human blood. Microbiology resource announcements. 2019;8(44).

191. McDermott EG, Morris EK, Garver LS. Sodium ascorbate as a potential toxicant in attractive sugar baits for control of adult mosquitoes (Diptera: Culicidae) and sand flies (Diptera: Psychodidae). Journal of medical entomology. 2019;56(5):1359-67.

192. McDermott EG, Mullens BA, Mayo CE, Roark EB, Maupin CR, Gerry AC, et al. Laboratory evaluation of stable isotope labeling of Culicoides (Diptera: Ceratopogonidae) for adult dispersal studies. Parasites & vectors. 2019;12(1):411.

193. McDonald JL, Ganulin ML, LoPresti ML, Adler AB. Sleep knowledge, goals, and habits in soldiers. Sleep health. 2019;5(4):426-8.

194. McLellan TM, Riviere LA, Williams KW, McGurk D, Lieberman HR. Caffeine and energy drink use by combat arms soldiers in Afghanistan as a countermeasure for sleep loss and high operational demands. Nutritional neuroscience. 2019;22(11):768-77.

195. Meffert SM, Neylan TC, McCulloch CE, Maganga L, Adamu Y, Kiweewa F, et al. East African HIV care: Depression and HIV outcomes. Global mental health (Cambridge, England). 2019;6:e9.

196. Meya DB, Okurut S, Zziwa G, Cose S, Boulware DR, Janoff EN. HIV-associated cryptococcal immune reconstitution inflammatory syndrome is associated with aberrant T cell function and increased cytokine responses. Journal of fungi (Basel, Switzerland). 2019;5(2).

197. Mgata S, Maluka SO. Factors for late initiation of antenatal care in Dar es Salaam, Tanzania: A qualitative study. BMC pregnancy and childbirth. 2019;19(1):415.

198. Michael NL. Simplified steps to heterologous prime-boost HIV vaccine development? The Journal of clinical investigation. 2019;129(11):4572-3.

199. Millar EV, Rice GK, Schlett CD, Elassal EM, Cer RZ, Frey KG, et al. Genomic epidemiology of MRSA infection and colonization isolates among military trainees with skin and soft tissue infection. Infection. 2019;47(5):729-37.

200. Millar EV, Schlett CD, Law NN, Whitman TJ, Ellis MW, Tribble DR, et al. Opportunities and obstacles in the prevention of skin and soft-tissue infections among military personnel. Military medicine. 2019;184(Suppl. 2):35-43.

201. Mody RM, Lakhal-Naouar I, Sherwood JE, Koles NL, Shaw D, Bigley DP, et al. Asymptomatic visceral Leishmania infantum infection in US soldiers deployed to Iraq. Clinical infectious diseases : an official publication of the Infectious Diseases Society of America. 2019;68(12):2036-44.

202. Monath TP, Fast PE, Modjarrad K, Clarke DK, Martin BK, Fusco J, et al. rVSVΔG-ZEBOV-GP (also designated V920) recombinant vesicular stomatitis virus pseudotyped with ebola Zaire glycoprotein: Standardized template with key considerations for a risk/benefit assessment. Vaccine X. 2019;1:100009.

203. Mondello S, Hasan A, Shear DA. Editorial: Developing Successful Neuroprotective Treatments for TBI: Translational Approaches, Novel Directions, Opportunities and Challenges. Frontiers in Neurology. 2019;10:1326.

204. Montgomery LD, Montgomery RW, Gerth WA, Bodo M, Stewart JM, Loughry M. Segmental intracellular, interstitial, and intravascular volume changes during simulated hemorrhage and resuscitation: A case study. Journal of Electrical Bioimpedance. 2019;10(1):40-6.

205. Moris P, Bauer KM, Currier JR, Friberg H, Eckels KH, Esquilin IO, et al. Cell-mediated immune responses to different formulations of a live-attenuated tetravalent dengue vaccine candidate in subjects living in dengue endemic and non-endemic regions. Human vaccines & immunotherapeutics. 2019;15(9):2090-105.

206. Motoki MT, Fonseca DM, Miot EF, Demari-Silva B, Thammavong P, Chonephetsarath S, et al. Population genetics of Aedes albopictus (Diptera: Culicidae) in its native range in Lao People's Democratic Republic. Parasites & vectors. 2019;12(1):477.

207. Motoki MT, Vongphayloth K, Rueda LM, Miot EF, Hiscox A, Hertz JC, et al. New records and updated checklist of mosquitoes (Diptera: Culicidae) from Lao People's Democratic Republic, with special emphasis on adult and larval surveillance in Khammuane Province. Journal of vector ecology : journal of the Society for Vector Ecology. 2019;44(1):76-88.

208. Mousseau G, Aneja R, Clementz MA, Mediouni S, Lima NS, Haregot A, et al. Resistance to the Tat inhibitor didehydro-cortistatin A is mediated by heightened basal HIV-1 transcription. mBio. 2019;10(4).

209. Muccini C, Crowell TA, Kroon E, Sacdalan C, Ramautarsing R, Seekaew P, et al. Leveraging early HIV diagnosis and treatment in Thailand to conduct HIV cure research. AIDS research and therapy. 2019;16(1):25.

210. Murphy H, Bodhidatta L, Sornsakrin S, Khadka B, Pokhrel A, Shakya S, et al. Traveler's diarrhea in Nepal-changes in etiology and antimicrobial resistance. Journal of travel medicine. 2019;26(8).

211. Mutai B, Njaanake K, Gathii K, Estambale BB, Waitumbi JN. A duo 4-plex real time PCR for detection of eight tick-borne zoonoses in Kenya. Open Journal of Clinical Diagnostics. 2019;9:1-15.

212. Nadai Y, Held K, Joseph S, Ahmed MIM, Hoffmann VS, Peterhoff D, et al. Envelope-specific recognition patterns of HIV vaccine-induced IgG antibodies are linked to immunogen structure and sequence. Frontiers in immunology. 2019;10:717.

213. Naluyima P, Kayondo W, Ritchie C, Wandege J, Kagabane S, Tumubeere L, et al. The Joint Mobile Emerging Disease Clinical Capability (JMEDICC) laboratory approach: Capabilities for high-consequence pathogen clinical research. PLoS neglected tropical diseases. 2019;13(12):e0007787.

214. Naluyima P, Lal KG, Costanzo MC, Kijak GH, Gonzalez VD, Blom K, et al. Terminal effector CD8 T cells defined by an IKZF2(+)IL-7R(-) transcriptional signature express FcgammaRIIIA, expand in HIV infection, and mediate potent HIV-specific antibody-dependent cellular cytotoxicity. Journal of immunology (Baltimore, Md : 1950). 2019;203(8):2210-21.

215. Nassif TH, Start AR, Toblin RL, Adler AB. Self-reported mindfulness and soldier health following a combat deployment. Psychological trauma : theory, research, practice and policy. 2019;11(4):466-74.

216. Ng'ang'a PN, Mutunga J, Oliech G, Mutero CM. Community knowledge and perceptions on malaria prevention and house screening in Nyabondo, Western Kenya. BMC public health. 2019;19(1):423.

217. Niquet J, Lumley L, Baldwin R, Rossetti F, Schultz M, de Araujo Furtado M, et al. Early polytherapy for benzodiazepine-refractory status epilepticus. Epilepsy & behavior : E&B. 2019;101(Pt B):106367.

218. Niu Q, Liu Z, Alamer E, Fan X, Chen H, Endsley J, et al. Structure-guided drug design identifies a BRD4-selective small molecule that suppresses HIV. The Journal of clinical investigation. 2019;130.

219. Nowak RG, Bentzen SM, Ravel J, Crowell TA, Dauda W, Ma B, et al. Anal microbial patterns and oncogenic human papillomavirus in a pilot study of Nigerian men who have sex with men at risk for or living with HIV. AIDS research and human retroviruses. 2019;35(3):267-75.

220. Nowak RG, Mitchell A, Crowell TA, Liu H, Ketende S, Ramadhani HO, et al. Individual and sexual network predictors of HIV incidence among men who have sex with men in Nigeria. Journal of acquired immune deficiency syndromes (1999). 2019;80(4):444-53.

221. Nowak RG, Ndembi N, Dauda W, Jibrin P, Bentzen SM, Nnaji CH, et al. Implementation of and early outcomes from anal cancer screening at a community-engaged health care facility providing care to Nigerian men who have sex with men. Journal of global oncology. 2019;5:1-11.

222. Occi JL, Egizi AM, Robbins RG, Fonseca DM. Annotated list of the hard ticks (Acari: Ixodida: Ixodidae) of New Jersey. Journal of medical entomology. 2019;56(3):589-98.

223. Odhiambo G, Bergmann-Leitner E, Maraka M, Wanjala CNL, Duncan E, Waitumbi J, et al. Correlation between malaria-specific antibody profiles and responses to artemisinin combination therapy for treatment of uncomplicated malaria in Western Kenya. The Journal of infectious diseases. 2019;219(12):1969-79.

224. Oh H, Braun AR, Reggia JA, Gentili RJ. Fronto-parietal mirror neuron system modeling: Visuospatial transformations support imitation learning independently of imitator perspective. Human movement science. 2019;65.

225. Okelloh D, Achola M, Opole J, Ogwang C, Agaya J, Sifuna P, et al. Lessons learned from community-based tuberculosis case-finding in western Kenya. Public health action. 2019;9(2):53-7.

226. Osgood JM, Finan PH, Hinman SJ, So CJ, Quartana PJ. Combat exposure, post-traumatic stress symptoms, and health-related behaviors: the role of sleep continuity and duration. Sleep. 2019;42(3).

227. Osoegawa K, Vayntrub TA, Wenda S, De Santis D, Barsakis K, Ivanova M, et al. Quality control project of NGS HLA genotyping for the 17th International HLA and Immunogenetics Workshop. Human immunology. 2019;80(4):228-36.

228. Pajcin M, White JM, Banks S, Dorrian J, Paech GM, Grant CL, et al. Effects of strategic early-morning caffeine gum administration on association between salivary alpha-amylase and neurobehavioural performance during 50h of sleep deprivation. Accident; analysis and prevention. 2019;126:160-72.

229. Pan WK, Seidman JC, Ali A, Hoest C, Mason C, Mondal D, et al. Oral polio vaccine response in the MAL-ED birth cohort study: Considerations for polio eradication strategies. Vaccine. 2019;37(2):352-65.

230. Pandya JD, Leung LY, Yang X, Flerlage WJ, Gilsdorf JS, Deng-Bryant Y, et al. Comprehensive profile of acute mitochondrial dysfunction in a preclinical model of severe penetrating TBI. Front Neurol. 2019;10:605.

231. Pantaleo G, Janes H, Karuna S, Grant S, Ouedraogo GL, Allen M, et al. Safety and immunogenicity of a multivalent HIV vaccine comprising envelope protein with either DNA or NYVAC vectors (HVTN 096): a phase 1b, double-blind, placebo-controlled trial. The lancet HIV. 2019;6(11):e737-e49.

232. Patel H, Althubaiti N, Parmar R, Yadav N, Joshi U, Tyagi RK, et al. Parasite load stemming from immunization route determines the duration of liver-stage immunity. Parasite immunology. 2019;41(7):e12622.

233. Penix EA, Kim PY, Wilk JE, Adler AB. Secondary traumatic stress in deployed healthcare staff. Psychological trauma : theory, research, practice and policy. 2019;11(1):1-9.

234. Penix EA, Whitmer DL, Thomas JL, Wilk JE, Adler AB. Behavioral health of US military veterinary personnel deployed to Afghanistan. Journal of the American Veterinary Medical Association. 2019;254(4):520-9.

235. Petney TN, Saijuntha W, Boulanger N, Chitimia-Dobler L, Pfeffer M, Eamudomkarn C, et al. Ticks (Argasidae, Ixodidae) and tick-borne diseases of continental Southeast Asia. Zootaxa. 2019;4558(1):1-89.

236. Philip CO, Koech M, Kipkemoi N, Kirera R, Ndonye J, Ombogo A, et al. Evaluation of the performance of a multiplex reverse transcription polymerase chain reaction kit as a potential diagnostic and surveillance kit for rotavirus in Kenya. Tropical diseases, travel medicine and vaccines. 2019;5:12.

237. Pichard LE, Simonelli G, Schwartz L, Balkin TJ, Hursh S. Precision medicine for sleep loss and fatigue management. Sleep medicine clinics. 2019;14(3):399-406.

238. Popescu M, Popescu EA, DeGraba TJ, Fernandez-Fidalgo DJ, Riedy G, Hughes JD. Post-traumatic stress disorder is associated with altered modulation of prefrontal alpha band oscillations during working memory. Clinical neurophysiology : official journal of the International Federation of Clinical Neurophysiology. 2019;130(10):1869-81.

239. Prestwood J, Chang D, McGann P, Barsoumian AE. Successful use of colistin monotherapy as outpatient parenteral antibiotic therapy for XDR Acinetobacter hepatic abscesses. Military medicine. 2019;184(3-4):E311-E3.

240. Punde N, Kooken J, Leary D, Legler PM, Angov E. Codon harmonization reduces amino acid misincorporation in bacterially expressed P. falciparum proteins and improves their immunogenicity. AMB Express. 2019;9(1):167.

241. Pusnik J, Eller MA, Tassaneetrithep B, Schultz BT, Eller LA, Nitayaphan S, et al. Expansion of stem cell-like CD4(+) memory T cells during acute HIV-1 infection is linked to rapid disease progression. Journal of virology. 2019;93(14).

242. Qureshi A, Aldersley A, Hollis B, Ponlawat A, Cator LJ. Male competition and the evolution of mating and life-history traits in experimental populations of Aedes aegypti. Proceedings Biological sciences. 2019;286(1904):20190591.

243. Raghavan RK, Barker SC, Cobos ME, Barker D, Teo EJM, Foley DH, et al. Potential spatial distribution of the newly introduced long-horned tick, Haemaphysalis longicornis in North America. Scientific reports. 2019;9(1):498.

244. Raghavan RK, Peterson AT, Cobos ME, Ganta R, Foley D. Current and future distribution of the lone star tick, Amblyomma americanum (L.) (Acari: Ixodidae) in North America. PloS one. 2019;14(1):e0209082.

245. Ramakrishnan A, Schumack NM, Gariepy CL, Eggleston H, Nunez G, Espinoza N, et al. Erratum for Ramakrishnan et al., "Enhanced immunogenicity and protective efficacy of a Campylobacter jejuni conjugate vaccine coadministered with liposomes containing monophosphoryl lipid A and QS-21". mSphere. 2019;4(3).

246. Ramakrishnan A, Schumack NM, Gariepy CL, Eggleston H, Nunez G, Espinoza N, et al. Correction for Ramakrishnan et al., "Enhanced immunogenicity and protective efficacy of a Campylobacter jejuni conjugate vaccine coadministered with liposomes containing monophosphoryl lipid A and QS-21". mSphere. 2019;4(3).

247. Ramakrishnan A, Schumack NM, Gariepy CL, Eggleston H, Nunez G, Espinoza N, et al. Enhanced immunogenicity and protective efficacy of a Campylobacter jejuni conjugate vaccine coadministered with liposomes containing monophosphoryl lipid A and QS-21. mSphere. 2019;4(3).

248. Rangaprakash D, Dretsch MN, Katz JS, Denney TS, Jr., Deshpande G. Dynamics of segregation and integration in directional brain networks: Illustration in soldiers with PTSD and neurotrauma. Frontiers in neuroscience. 2019;13:803.

249. Raqib R, Sarker P, Zaman K, Alam NH, Wierzba TF, Maier N, et al. A phase I trial of WRSS1, a Shigella sonnei live oral vaccine in Bangladeshi adults and children. Human vaccines & immunotherapeutics. 2019;15(6):1326-37.

250. Rauch SAM, Kim HM, Powell C, Tuerk PW, Simon NM, Acierno R, et al. Efficacy of prolonged exposure therapy, sertraline hydrochloride, and their combination among combat veterans with posttraumatic stress disorder: A randomized clinical trial. JAMA psychiatry. 2019;76(2):117-26.

251. Reifman J, Ramakrishnan S, Liu J, Kapela A, Doty TJ, Balkin TJ, et al. 2B-Alert App: A mobile application for real-time individualized prediction of alertness. Journal of sleep research. 2019;28(2):e12725.

252. Rice MW, Pandya JD, Shear DA. Gut microbiota as a therapeutic target to ameliorate the biochemical, neuroanatomical, and behavioral effects of traumatic brain injuries. Front Neurol. 2019;10:875.

253. Richard SA, McCormick BJJ, Murray-Kolb LE, Lee GO, Seidman JC, Mahfuz M, et al. Enteric dysfunction and other factors associated with attained size at 5 years: MAL-ED birth cohort study findings. The American journal of clinical nutrition. 2019;110(1):131–8.

254. Ritland BM, Simonelli G, Gentili RJ, Smith JC, He X, Mantua J, et al. Effects of sleep extension on cognitive/motor performance and motivation in military tactical athletes. Sleep medicine. 2019;58:48-55.

255. Ritland BM, Simonelli G, Gentili RJ, Smith JC, He X, Oh H, et al. Sleep health and its association with performance and motivation in tactical athletes enrolled in the Reserve Officers' Training Corps. Sleep health. 2019;5(3):309-14.

256. Rivers C, Chretien JP, Riley S, Pavlin JA, Woodward A, Brett-Major D, et al. Using "outbreak science" to strengthen the use of models during epidemics. Nature communications. 2019;10(1):3102.

257. Riviere LA. Child well-being in the civilian literature. Journal of Military, Veteran and Family Health. 2019;5(Suppl. 2):8-28.

258. Rolland M. Editorial: HIV-1 transmission and phylogenetics. Current opinion in HIV and AIDS. 2019;14(3):151-2.

259. Rolland M. HIV-1 phylogenetics and vaccines. Current opinion in HIV and AIDS. 2019;14(3):227-32.

260. Rossenkhan R, Rolland M, Labuschagne JPL, Ferreira RC, Magaret CA, Carpp LN, et al. Combining viral genetics and statistical modeling to improve HIV-1 time-of-infection estimation towards enhanced vaccine efficacy assessment. Viruses. 2019;11(7).

261. Rothan HA, Zhong Y, Sanborn MA, Teoh TC, Ruan J, Yusof R, et al. Small molecule grp94 inhibitors block dengue and Zika virus replication. Antiviral research. 2019;171:104590.

262. Ruang-areerate T, Piyaraj P, Ponlawat A, Mungthin M, Leelayoova S. Distribution and predicting environmental suitability of Sergentomyia gemmea and Sergentomyia barraudi (Diptera: Psychodidae) in Thailand. Southeast Asian Journal of Tropical Medicine and Public Health. 2019;50(1):64-78.

263. Rungrojcharoenkit K, Kittikraisak W, Ditsungnoen D, Olsen SJ, Suntarattiwong P, Chotpitayasunondh T, et al. Influenza virus seroincidence in a cohort of healthy and high-risk children enrolled in infancy, Bangkok, Thailand. International journal of infectious diseases : IJID : official publication of the International Society for Infectious Diseases. 2019;89:21-6.

264. Sacristan I, Acuna F, Aguilar E, Garcia S, Lopez MJ, Cevidanes A, et al. Assessing cross-species transmission of hemoplasmas at the wild-domestic felid interface in Chile using genetic and landscape variables analysis. Scientific reports. 2019;9(1):16816.

265. Sajja VSSS, LaValle C, Salib JE, Misistia AC, Ghebremedhin MY, Ramos AN, et al. The role of very low level blast overpressure in symptomatology. Frontiers in Neurology. 2019;10:891.

266. Sakpaisal P, Silapong S, Yowang A, Boonyasakyothin G, Yuttayong B, Suksawad U, et al. Prevalence and genotypic distribution of rotavirus in Thailand: A multicenter study. The American journal of tropical medicine and hygiene. 2019;100(5):1258-65.

267. Sanborn MA, Klein TA, Kim HC, Fung CK, Figueroa KL, Yang Y, et al. Metagenomic analysis reveals three novel and prevalent mosquito viruses from a single pool of Aedes vexans nipponii collected in the Republic of Korea. Viruses. 2019;11(3).

268. Sanchez-Vargas LA, Kounlavouth S, Smith ML, Anderson KB, Srikiatkhachorn A, Ellison DW, et al. Longitudinal analysis of memory B and T cell responses to dengue virus in a 5-year prospective cohort study in Thailand. Frontiers in Immunology. 2019;10:8.

269. Sangjan S, Ampol S, Tabprasit S, Horthongkham N, Chuenchitra T, Ekpo P, et al. Common antibody dependent cell mediated cytotoxicity (ADCC) antibody epitopes of HIV-1 CRF01_AE Env and Gag in early HIV-1 infected individuals. Asian Pacific journal of allergy and immunology. 2019;37(1):43-50.

270. Sanjakdar SS, Flerlage WJ, Kang HS, Napier DA, Dougherty JR, Mountney A, et al. Differential effects of caffeine on motor and cognitive outcomes of penetrating ballistic-like brain injury. Military medicine. 2019;184(Suppl. 1):291-300.

271. Sanprick A, Yooyen T, Rodkvamtook W. Survey of Rickettsia spp. and Orientia tsutsugamushi pathogens found in animal vectors (ticks, fleas, chiggers) in Bangkaew District, Phatthalung Province, Thailand. The Korean journal of parasitology. 2019;57(2):167-73.

272. Saremi NF, Supple MA, Byrne A, Cahill JA, Coutinho LL, Dalen L, et al. Author Correction: Puma genomes from North and South America provide insights into the genomic consequences of inbreeding. Nature communications. 2019;10(1):5276.

273. Saremi NF, Supple MA, Byrne A, Cahill JA, Coutinho LL, Dalen L, et al. Puma genomes from North and South America provide insights into the genomic consequences of inbreeding. Nature communications. 2019;10(1):4769.

274. Savarino SJ, McKenzie R, Tribble DR, Porter CK, O'Dowd A, Sincock SA, et al. Hyperimmune bovine colostral anti-CS17 antibodies protect against enterotoxigenic Escherichia coli diarrhea in a randomized, doubled-blind, placebo-controlled human infection model. The Journal of infectious diseases. 2019;220(3):505-13.

275. Schifanella L, Barnett SW, Bissa M, Galli V, Doster MN, Vaccari M, et al. ALVAC-HIV B/C candidate HIV vaccine efficacy dependent on neutralization profile of challenge virus and adjuvant dose and type. PLoS pathogens. 2019;15(12):e1008121.

276. Scultetus AH, Jefferson MA, Haque A, Ho L, Hazzard B, Saha BK, et al. Hypobaria during long-range flight resulted in significantly increased histopathological evidence of lung and brain damage in a swine model. The journal of trauma and acute care surgery. 2019;86(1):116-22.

277. Sea-Liang N, Sereemaspun A, Patarakul K, Gaywee J, Rodkvamtook W, Srisawat N, et al. Development of multiplex PCR for neglected infectious diseases. PLoS neglected tropical diseases. 2019;13(7):e0007440.

278. Sergueev KV, Filippov AA, Farlow J, Su W, Kvachadze L, Balarjishvili N, et al. Correlation of host range expansion of therapeutic bacteriophage Sb-1 with allele state at a hypervariable repeat locus. Applied and environmental microbiology. 2019;85(22).

279. Shetty AC, Jacob CG, Huang F, Li Y, Agrawal S, Saunders DL, et al. Genomic structure and diversity of Plasmodium falciparum in Southeast Asia reveal recent parasite migration patterns. Nature communications. 2019;10(1):2665.

280. Sifuna PM, Ouma C, Atieli H, Owuoth J, Onyango D, Andagalu B, et al. Spatial epidemiology of tuberculosis in the high-burden counties of Kisumu and Siaya, Western Kenya, 2012-2015. The international journal of tuberculosis and lung disease : the official journal of the International Union against Tuberculosis and Lung Disease. 2019;23(3):363-70.

281. Simonelli G, Mantua J, Gad M, St Pierre M, Moore L, Yarnell AM, et al. Sleep extension reduces pain sensitivity. Sleep medicine. 2019;54:172-6.

282. Singh P, Beck Z, Matyas GR, Alving CR. Saturated phospholipids are required for nano- to micron-size transformation of cholesterol-containing liposomes upon QS21 addition. Journal of liposome research. 2019;29(3):247-50.

283. Singh P, Bodycomb J, Travers B, Tatarkiewicz K, Travers S, Matyas GR, et al. Particle size analyses of polydisperse liposome formulations with a novel multispectral advanced nanoparticle tracking technology. International journal of pharmaceutics. 2019;566:680-6.

284. Sipos ML, Lopez AA, Nyland J, Taylor MR, McDonald J, LoPresti ML, et al. U.S. soldiers and foreign language school: Stressors and health. Military medicine. 2019;184(7-8):e344-e52.

285. Skotak M, LaValle C, Misistia A, Egnoto MJ, Chandra N, Kamimori G. Occupational blast wave exposure during multiday 0.50 caliber rifle course. Frontiers in Neurology. 2019;10:Article 797.

286. Snesrud E, McGann P, Walsh E, Ong A, Maybank R, Kwak Y, et al. Clinical and genomic features of the first cases of Elizabethkingia anophelis infection in New York, including the first case in a healthy infant without previous nosocomial exposure. Journal of the Pediatric Infectious Diseases Society. 2019;8(3):269-71.

287. Sosa N, Pascale JM, Jimenez AI, Norwood JA, Kreishman-Detrick M, Weina PJ, et al. Topical paromomycin for New World cutaneous leishmaniasis. PLoS neglected tropical diseases. 2019;13(5):e0007253.

288. Sprecher KE, Ritchie HK, Burke TM, Depner CM, Smits AN, Dorrestein PC, et al. Trait-like vulnerability of higher-order cognition and ability to maintain wakefulness during combined sleep restriction and circadian misalignment. Sleep. 2019;42(8).

289. Spring MD, Sousa JC, Li Q, Darko CA, Morrison MN, Marcsisin SR, et al. Determination of cytochrome P450 isoenzyme 2D6 (CYP2D6) genotypes and pharmacogenomic impact on primaquine metabolism in an active-duty US military population. The Journal of infectious diseases. 2019;220(11):1761-70.

290. Stafford KA, Odafe SF, Lo J, Ibrahim R, Ehoche A, Niyang M, et al. Evaluation of the clinical outcomes of the Test and Treat strategy to implement Treat All in Nigeria: Results from the Nigeria Multi-Center ART Study. PloS one. 2019;14(7):e0218555.

291. Start AR, Allard Y, Adler A, Toblin R. Predicting suicide ideation in the military: The independent role of aggression. Suicide & life-threatening behavior. 2019;49(2):444-54.

292. Strich JR, Wang H, Cisse OH, Youn JH, Drake SK, Chen Y, et al. Identification of the OXA-48 Carbapenemase Family by Use of Tryptic Peptides and Liquid Chromatography-Tandem Mass Spectrometry. Journal of clinical microbiology. 2019;57(5).

293. Subra C, Trautmann L. Role of T lymphocytes in HIV neuropathogenesis. Current HIV/AIDS reports. 2019;16(3):236-43.

294. Takata H, Kessing C, Sy A, Lima N, Sciumbata J, Mori L, et al. Modeling HIV-1 latency using primary CD4(+) T cells from HIV-1 infected ART suppressed individuals. Journal of virology. 2019;93(11).

295. Takhampunya R, Korkusol A, Pongpichit C, Yodin K, Rungrojn A, Chanarat N, et al. Metagenomic approach to characterizing disease epidemiology in a disease-endemic environment in Northern Thailand. Frontiers in microbiology. 2019;10:319.

296. Talaat KR, Bourgeois AL, Frenck RW, Chen WH, MacLennan CA, Riddle MS, et al. Consensus Report on Shigella Controlled Human Infection Model: Conduct of Studies. Clinical infectious diseases : an official publication of the Infectious Diseases Society of America. 2019;69(Suppl. 8):S580-90.

297. Techawiwattanaboon T, Barnier-Quer C, Palaga T, Jacquet A, Collin N, Sangjun N, et al. Reduced renal colonization and enhanced protection by leptospiral factor H binding proteins as a multisubunit vaccine against leptospirosis in hamsters. Vaccines. 2019;7(3).

298. Teyhen DS. Carpal Tunnel Syndrome: Treating Hand Pain and Numbness. The Journal of orthopaedic and sports physical therapy. 2019;49(5):361.

299. Teyhen DS. Patellofemoral Pain: Treating Painful Kneecaps. The Journal of orthopaedic and sports physical therapy. 2019;49(9):633.

300. Thomas JL, Adrian AL, Wood MD, Crouch CL, Lee JD, Adler AB. Mental health and stress among army civilians, spouses, and soldiers in a closing military community. Armed Forces & Society. 2019;45(4):612-36.

301. Thomas JL, Bliese PD, Castro CA, Cotting DI, Cox A, Adler AB. Mental health training following combat: A randomized controlled trial comparing group size. Mil behav Health. 2019;7(3):354-62.

302. Tisdale CS, Justin GA, Wang X, Chu X, Carlton DK, Okulicz JF, et al. Refractive surgery in the HIV-positive U.S. Military Natural History Study Cohort: complications and risk factors. Journal of cataract and refractive surgery. 2019;45(11):1612-8.

303. Tisdale MD, Tribble DR, Telu K, Fraser JA, Connor P, Philip C, et al. A comparison of stool enteropathogen detection by semiquantitative PCR in adults with acute travelers' diarrhea before and 3 weeks after successful antibiotic treatment. Open forum infectious diseases. 2019;6(5):ofz187.

304. Tovanabutra S, Sirijatuphat R, Pham PT, Bonar L, Harbolick EA, Bose M, et al. Deep sequencing reveals central nervous system compartmentalization in multiple transmitted/founder virus acute HIV-1 infection. Cells. 2019;8(8).

305. Trinh HV, Gohain N, Pham PT, Hamlin C, Song H, Sanders-Buell E, et al. Humoral response to the HIV-1 envelope V2 Region in a Thai early acute infection cohort. Cells. 2019;8(4).

306. Trinh HV, Gohain N, Pham PT, Hamlin C, Song H, Sanders-Buell E, et al. Correction: Trinh, H.V., et al. Humoral response to the HIV-1 envelope V2 region in a Thai early acute infection cohort. Cells 2019, 8, 365. Cells. 2019;8(6).

307. Tweedell RE, Tao DY, Hamerly T, Robinson TM, Larsen S, Gronning AGB, et al. The selection of a hepatocyte cell line susceptible to Plasmodium falciparum sporozoite invasion that is associated with expression of glypican-3. Frontiers in Microbiology. 2019;10:127.

308. Van Bocxlaer K, Caridha D, Black C, Vesely B, Leed S, Sciotti RJ, et al. Novel benzoxaborole, nitroimidazole and aminopyrazoles with activity against experimental cutaneous leishmaniasis. International journal for parasitology Drugs and drug resistance. 2019;11:129-38.

309. Vasan S, Robb ML. Harnessing circulating microRNAs for early HIV diagnosis. EBioMedicine. 2019;44:18-9.

310. Vekemans J, Moorthy V, Giersing B, Friede M, Hombach J, Arora N, et al. Respiratory syncytial virus vaccine research and development: World Health Organization technological roadmap and preferred product characteristics. Vaccine. 2019;37(50):7394-5.

311. Vieira VA, Zuidewind P, Muenchhoff M, Roider J, Millar J, Clapson M, et al. Strong sex bias in elite control of paediatric HIV infection. AIDS (London, England). 2019;33(1):67-75.

312. Wade BSC, Valcour VG, Puthanakit T, Saremi A, Gutman BA, Nir TM, et al. Mapping abnormal subcortical neurodevelopment in a cohort of Thai children with HIV. NeuroImage Clinical. 2019;23:101810.

313. Waickman AT, Friberg H, Gargulak M, Kong A, Polhemus M, Endy T, et al. Assessing the diversity and stability of cellular immunity generated in response to the candidate live-attenuated dengue virus vaccine TAK-003. Frontiers in immunology. 2019;10:1778.

314. Waickman AT, Victor K, Li T, Hatch K, Rutvisuttinunt W, Medin C, et al. Dissecting the heterogeneity of DENV vaccine-elicited cellular immunity using single-cell RNA sequencing and metabolic profiling. Nature communications. 2019;10(1):3666.

315. Wang HH, Chen Y, Strich JR, Drake SK, Youn JH, Rosenberg AZ, et al. Rapid detection of colistin resistance protein MCR-1 by LC-MS/MS. Clinical Proteomics. 2019;16.

316. Warrasak S, Euswas A, Fukuda MM, Ittiverakul M, Miller RS, Krudsood S, et al. Comparative ophthalmic assessment of patients receiving tafenoquine or chloroquine/primaquine in a randomized clinical trial for Plasmodium vivax malaria radical cure. International ophthalmology. 2019;39(8):1767-82.

317. Weerts HP, Yu J, Kaminski RW, Nahm MH. A high-throughput Shigella-specific bactericidal assay. Journal of visualized experiments : JoVE. 2019(144).

318. Whittaker JL, Ellis R, Hodges PW, C OS, Hides J, Fernandez-Carnero S, et al. Imaging with ultrasound in physical therapy: What is the PT's scope of practice? A competency-based educational model and training recommendations. British journal of sports medicine. 2019;53(23):1447-53.

319. Williams JB, Toblin RL, Duffy FF, Shannahoff ME, Wilk JE. Fidelity to best practices of psychiatric assessments in army behavioral health settings. Journal of psychiatric practice. 2019;25(2):103-17.

320. Wojnarski M, Lon C, Vanachayangkul P, Gosi P, Sok S, Rachmat A, et al. Atovaquone-proguanil in combination with artesunate to treat multidrug-resistant P. falciparum malaria in Cambodia: An open-label randomized trial. Open forum infectious diseases. 2019;6(9):ofz314.

321. Wojnarski M, Mouri O, Chambrion C, Roussel C, Chartrel N, Smith B, et al. Plasmodium falciparum clearance is pitting-dependent with artemisinin-based drugs but pitting-independent with atovaquone-proguanil or mefloquine Short tittle: Drug-specific pitting in malaria. The Journal of infectious diseases. 2019;220(3):535-9.

322. Yang Z, Zhu T, Mondello S, Akel M, Wong AT, Kothari IM, et al. Serum-based phospho-neurofilament-heavy protein as theranostic biomarker in three models of traumatic brain injury: An Operation Brain Trauma Therapy study. Journal of neurotrauma. 2019;36(2):348-59.

323. Yeh KB, Wood H, Scullion M, Russell JA, Parker K, Gnade BT, et al. Molecular detection of biological agents in the field: Then and now. mSphere. 2019;4(6).

324. Younis RM, Taylor RM, Beardsley PM, McClay JL. The ANKS1B gene and its associated phenotypes: focus on CNS drug response. Pharmacogenomics. 2019;20(9):669-84.

325. Yuen CM, Agaya J, McHembere W, Okelloh D, Achola M, Opole J, et al. Optimizing the efficiency of tuberculosis active case-finding in health facilities and communities. The international journal of tuberculosis and lung disease : the official journal of the International Union against Tuberculosis and Lung Disease. 2019;23(7):844-9.

326. Zeng Q, Xie L, Zhang J, Vuong C, Potter B, Aylor S, et al. Improving relative bioavailability of oral imidazolidinedione by reducing particle size using homogenization and ultra-sonication. Military medicine. 2019;184(Suppl. 1):106-13.

327. Zhang L, Irimia A, He L, Landais E, Rantalainen K, Leaman DP, et al. An MPER antibody neutralizes HIV-1 using germline features shared among donors. Nature communications. 2019;10(1):5389.

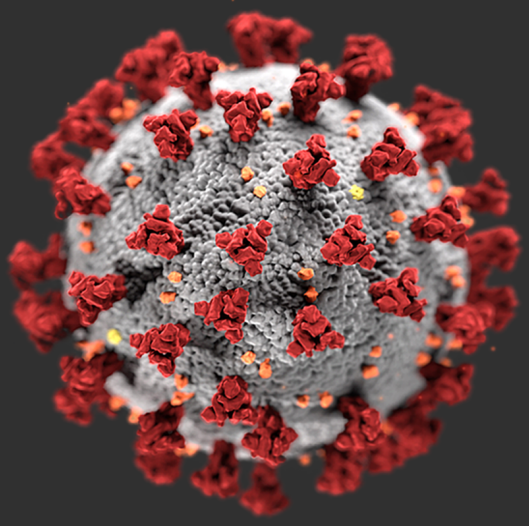
328. Zurawski DV, Banerjee J, Alamneh YA, Shearer JP, Demons ST. Skin and soft tissue models for Acinetobacter baumannii infection. Methods in molecular biology (Clifton, NJ). 2019;1946:271-87.

329. Zurawski DV, Black CC, Alamneh YA, Biggemann L, Banerjee J, Thompson MG, et al. A porcine wound model of acinetobacter baumannii infection. Adv Wound Care. 2019;8(1):14-27.

COVID-19

OVERVIEW

COVID-19 threatens political and economic stability, overwhelms capacity, and jeopardizes a calibrated force posture and the homeland. WRAIR is part of the U.S. Army Medical Research and Development Command's efforts to detect, prevent and treat covid-19 infection.



COVID-19 SPREAD IN FOUR MONTHS

WHAT IS IT?

COVID-19 is an illness caused by a coronavirus.

COVID-19 has not been previously identified in humans. At this time, there are no specific vaccines or treatments for COVID-19.

WHAT WE'RE DOING ABOUT IT

PREVENT:
Creating a safe, efficacious vaccine and monoclonal antibodies

DETECT:
Developing new tests for existing platforms in small, medium and large treatment facilities as well as the field to increase throughput and capacity

TREAT:
Identifying, advancing, and gaining access to novel and existing antiviral drugs

USAMRDC'S CAPABILITIES

DISEASE SURVEILLANCE
WRAIR's laboratories on three continents and USAMRIID's deployable Center for Genomic Surveillance work to identify emerging infectious disease threats

DISCOVERY
WRAIR and USAMRIID have the capabilities and experience to develop vaccines, treatment and prevention drugs, monoclonal antibodies, and diagnostics

MANUFACTURING
WRAIR's newly renovated Pilot Bioproduction Facility can manufacture vaccines and biologics to support pre-clinical and early clinical testing

PRE-CLINICAL
USAMRIID and WRAIR begin testing novel products in animal models to forecast safety and efficacy prior to any human exposure

CLINICAL
WRAIR and USAMRIID operate clinical trial centers to perform early-stage clinical trials to test novel countermeasures

DELIVERY
Product managers at USAMMDA work with the laboratories and user community to guide medical product development and acquisition while ensuring Warfighter relevance